

Installation Manual

UAIS TRANSPONDER

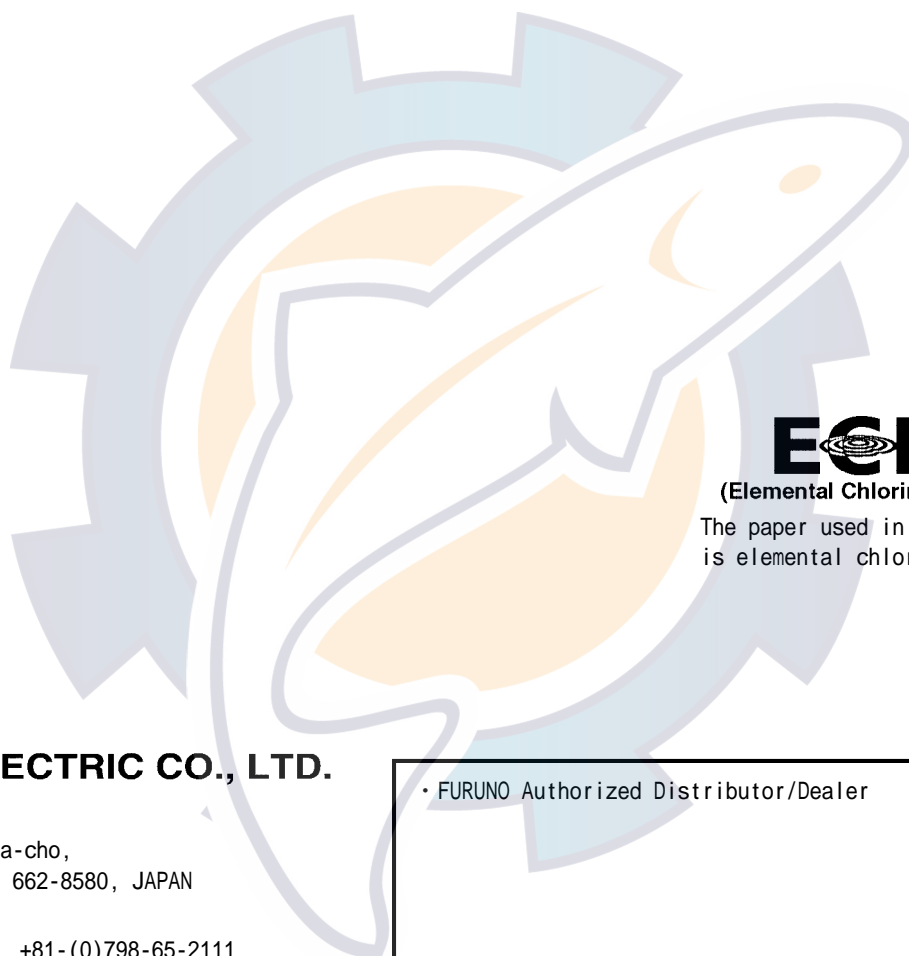
FA-150

SAFETY INSTRUCTIONS.....	i
SYSTEM CONFIGURATIONS.....	ii
EQUIPMENT LIST.....	iii
1. MOUNTING.....	1
1.1 Antenna Units	1
1.2 Monitor Unit	8
1.3 UAIS Transponder.....	10
1.4 Power Supply (option).....	11
1.5 Pilot Plug (option).....	11
2. WIRING	12
2.1 Connection.....	12
2.2 Changing Ship's Mains Specifications	17
3. SETTING AND ADJUSTMENT	18
3.1 Stting MMSI, IMO No., Name and Cell Sign	18
3.2 Setting GPS Antenna Position	20
3.3 Setting Ship Type.....	21
3.4 Setting I/O Port	21
4. ATTACHING LAN KIT (OPTION).....	25
5. IEC 61162-1/2 DATA SENTENCES	28
PACKING LISTS.....	A-1
OUTLINE DRAWINGS	D-1
INTERCONNECTION DIAGRAM	S-1



FURUNO ELECTRIC CO., LTD.

www.furuno.co.jp



ECF

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

FURUNO ELECTRIC CO., LTD.

9-52 Ashihara-cho,
Nishinomiya, 662-8580, JAPAN

Telephone : +81-(0)798-65-2111
Fax : +81-(0)798-65-4200

• FURUNO Authorized Distributor/Dealer

All rights reserved.

Printed in Japan

Pub. No. IME-44310-D

(TATA) FA-150

A : NOV . 2004

D : JUN . 11, 2008



* 0 0 0 1 5 0 0 8 3 1 3 *



SAFETY INSTRUCTIONS



WARNING



ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

Do not install the equipment where it may get wet from rain or water splash.

Water in the equipment can result in fire, electrical shock or damage the equipment.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or damage the equipment. The voltage rating of the equipment appears on the label above the power connector.



CAUTION

Observe the following compass safe distances to prevent interference to a magnetic compass:

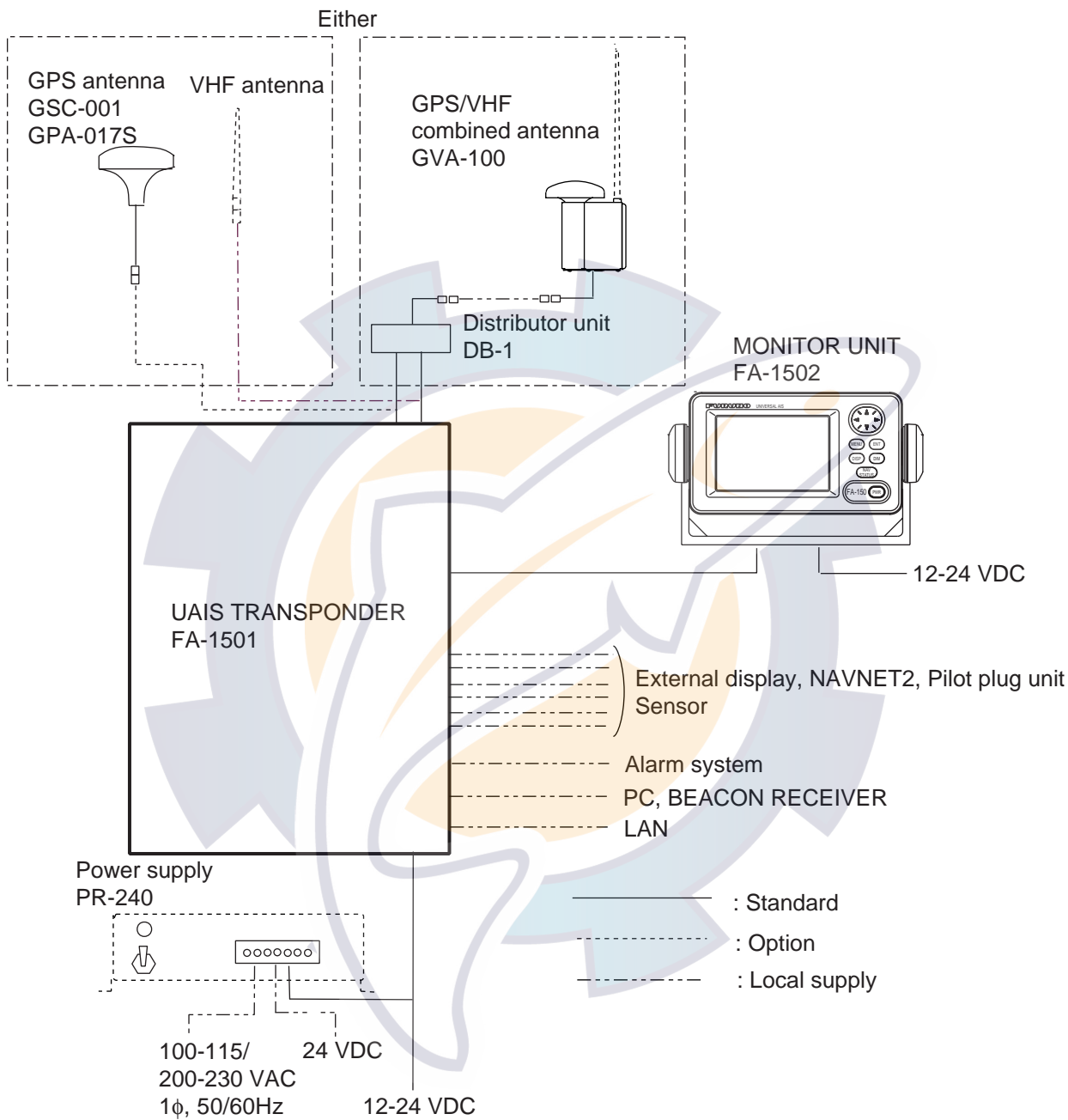
	Standard compass	Steering compass
FA-1501 UAIS Transponder	1.2 m	0.8 m
FA-1502 Monitor unit	0.45 m	0.3 m
GVA-100	0.3 m	0.3 m
DB-1	0.3 m	0.3 m
PR-240	0.9m	0.6 m



Attach securely protective earth to the ship's body.

The protective earth is required to the power supply to prevent electrical shock.

SYSTEM CONFIGURATION



Category of the units

GSC-001	Exposed to the weather
GPA-017S	Exposed to the weather
GVA-100	Exposed to the weather
FA-1501	Protected from the weather
FA-1502	Protected from the weather
DB-1	Protected from the weather
PR-240	Protected from the weather

EQUIPMENT LISTS

Standard supply

No.	Name	Type	Code no.	Qty	Remarks
1	UAIS Transponder	FA-1501	-	1	
2	Monitor Unit	FA-1502	-	1	
3	GPS Antenna	GSC-001	-	1	Select one.
		GPA-017S	-		
	GPS/VHF Combined	GVA-100	-		
4	Installation Materials	MJ-A10SPF0012-050	000-150-216	1	Cable for FA-1501
		CP24-00501	005-955-550		For FA-1501
		CP24-00400	000-041-980	1	For FA-1502 CP14-06001 & Cable MJ-A3SPF0013-0 35
		CP24-00101	005-950-730	1	For DB-1
		CP24-00141	005-952-330	1	For GVA-100
		CP24-00502	005-955-560	1	For GPA-017S/ GSC-001
5	Accessories	FP14-02801	004-366-960	1	For FA-1502
6	Spare Parts	SP24-00101	-	1	For FA-1502

Optional supply

No.	Name	Type	Code no.	Remarks	
1	Monitor unit	FA-1502	-		
2	Antenna cable set	CP20-02700	004-381-160	8D-FB-CV(30m)+CP20-02701	
		CP20-02710	004-381-170	8D-FB-CV(50m)+CP20-02701	
3	Antenna cable set	CP24-00300	000-041-938	8D-FB-CV(30m)+CP24-00301	
		CP24-00310	000-041-939	8D-FB-CV(50m)+CP24-00301	
4	Coaxial cable	TNC-PS-3D-15	000-133-670	TNC-TNC, 15m	
5	Mast mount fixture	CP20-01111	004-365-780	For GSC-001	
6	Right-angle antenna base	No.13-QA330	000-803-239	For GSC-001	
7	L-angle antenna base	No.13-QA310	000-803-240	For GSC-001	
8	Antenna base for rail mount	No.13-RC5160	000-806-114	For GSC-001	
9	Whip antenna	FAB-151D	000-572-029	For Japan only	
10	Antenna fixing bracket	4-310071	000-572-184	For FAB-151D	
11	Whip antenna	150M-W2VN	000-113-498	For outside Japan	
12	AC-DC power supply	PR-240	-	Include installation materials CP24-00151*	
13	Pilot plug	OP24-3	000-053-911		
14	AD-100	AD-100	-	For gyrocompass	
15	Cable assy.	MJ-A10SPF 0012-050	000-150-216	5m	Transponder-display, connector attached at one end
		MJ-A10SPF 0012-100	000-150-217	10m	
		MJ-A10SPF 0012-250	000-150-218	25m	
		MJ-A10SPF 0012-500	000-150-219	50m	
		MJ-A10SPF 0012-1000	000-150-220	100m	
16	Flush mount kit S	OP20-17	000-040-720	For monitor unit	
	Flush mount kit F	OP20-29	000-041-405		
17	φ 80 Mast mount kit	OP24-5	005-954-510	For GVA-100	
18	GPS antenna	GSC-001-FA-T	-		
19	LAN kit	OP24-8	005-956-020	See page 25.	
20	UAIS display software	FAISPC MARK-2	005-860-470		
21	AIS display software CD	FAISPC-MX-50	001-046-340	LAN kit required	

1. MOUNTING

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

1.1 Antenna Units

1.1.1 GPS antenna unit

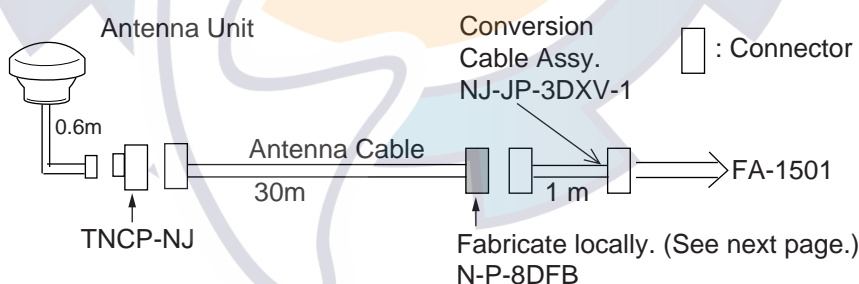
Install the GPS antenna unit referring to the drawing on page D-5 or D-6 at the back of this manual. When selecting a mounting location for the antenna, keep in mind the following points.

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible to keep it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.

Extending antenna cable

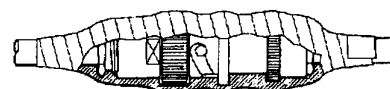
Three types of antenna cable extensions are optionally available.

a) Antenna cable set CP20-02700



◆ Waterproofing connector

Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with a cable-tie.



Waterproofing connector

b) Antenna cable set CP20-02710 (8D-FB-CV, 50m)

Connect the cable the same as a) above.

c) Cable type RG-10/UY (shipyard supply)

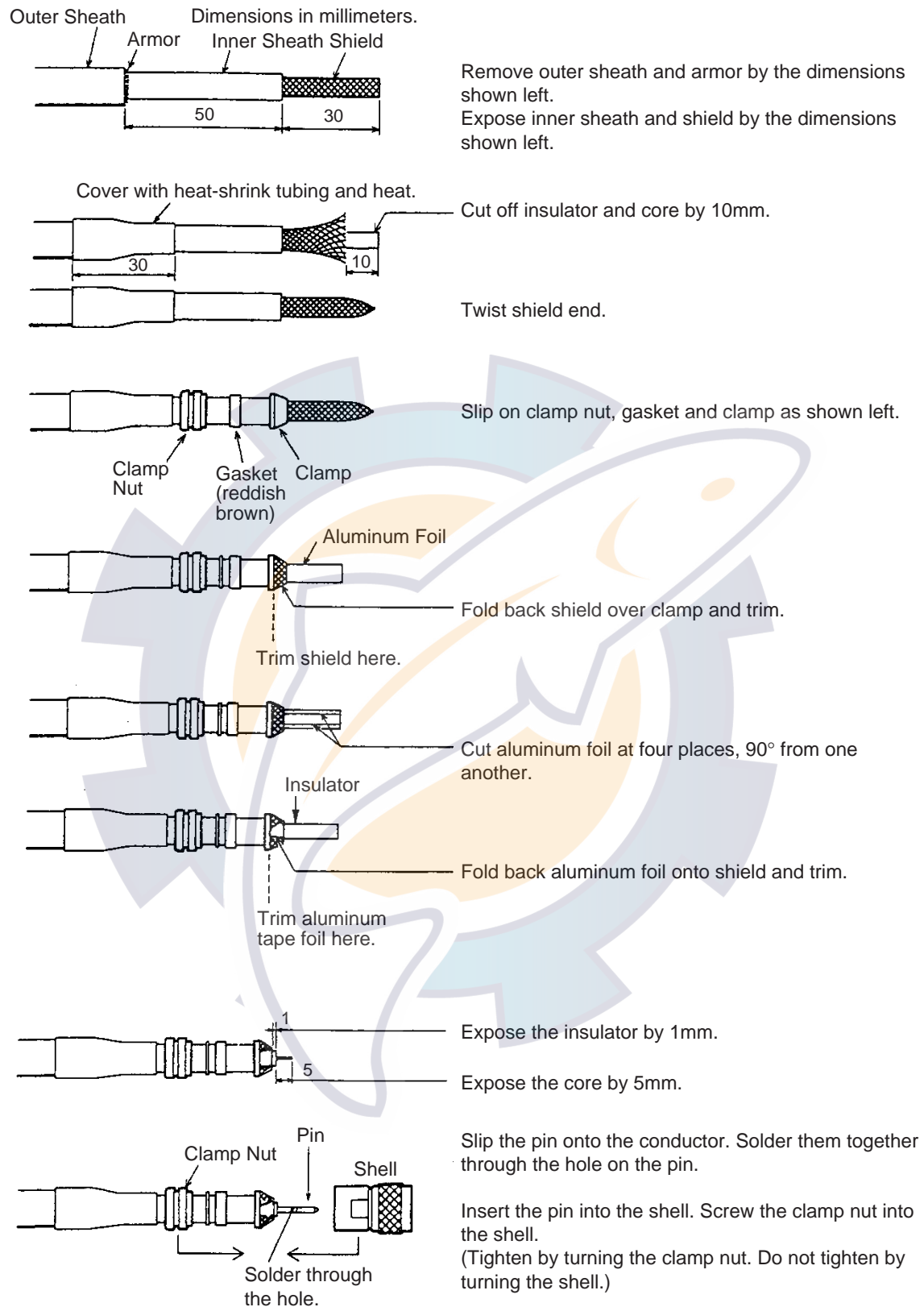
Note: The length of this cable should be less than 20 m to prevent signal loss.

The coax. coupling cable assy.(type: NJ-TP+3DXV-1, code no.

000-123-809), coaxial connector(N-P-8DFB; supplied), vulcanizing tape

and vinyl tape are required. Fabricate both ends of the cable as shown in the figure on the next page.

How to attach the connector N-P-8DFB for cable 8D-FB-CV



How to attach connector N-P-8DFB

1.1.2 VHF antenna

Location

The location of the mandatory AIS VHF-antenna should be carefully considered. Digital communication is more sensitive than analog/voice communication to interference created by reflections in obstructions like masts and booms. It may be necessary to relocate the VHF radiotelephone antenna to minimize interference effects.

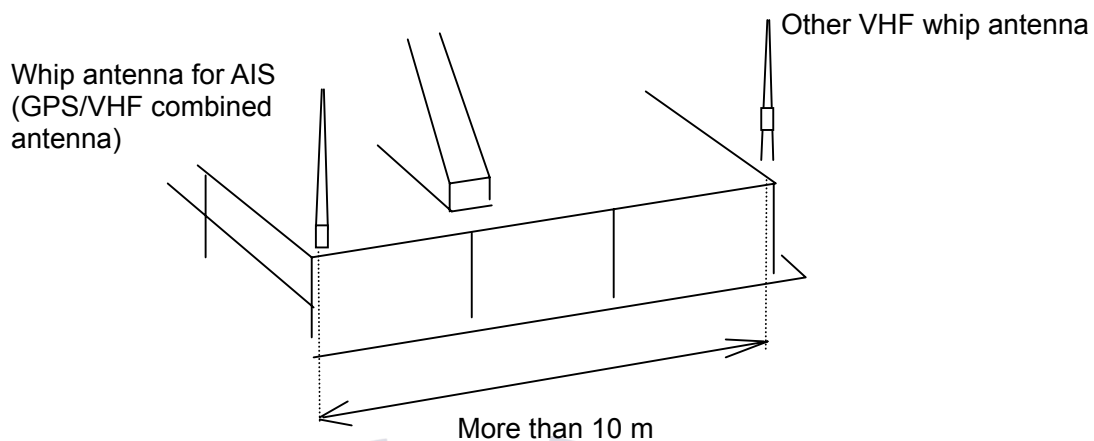
To minimise interference effects, the following guidelines apply:

- The AIS VHF antenna should be placed in an elevated position that is as free as possible with a minimum of 0.5 meters in the horizontal direction from constructions made of conductive materials. The antenna should not be installed close to any large vertical obstruction. The objective for the AIS VHF antenna is to see the horizon freely through 360 degrees.
- The AIS VHF antenna should be installed safely away from interfering high-power energy sources like radar and other transmitting radio antennas, preferably at least 3 meters away from and out of the transmitting beam.
- There should not be more than one antenna on the same plane. The AIS VHF antenna should be mounted directly above or below the ship's primary VHF radiotelephone antenna, with no horizontal separation and with a minimum of 2.8 meters vertical separation. If it is located on the same plane as other antennas, the distance apart should be at least 10 meters.

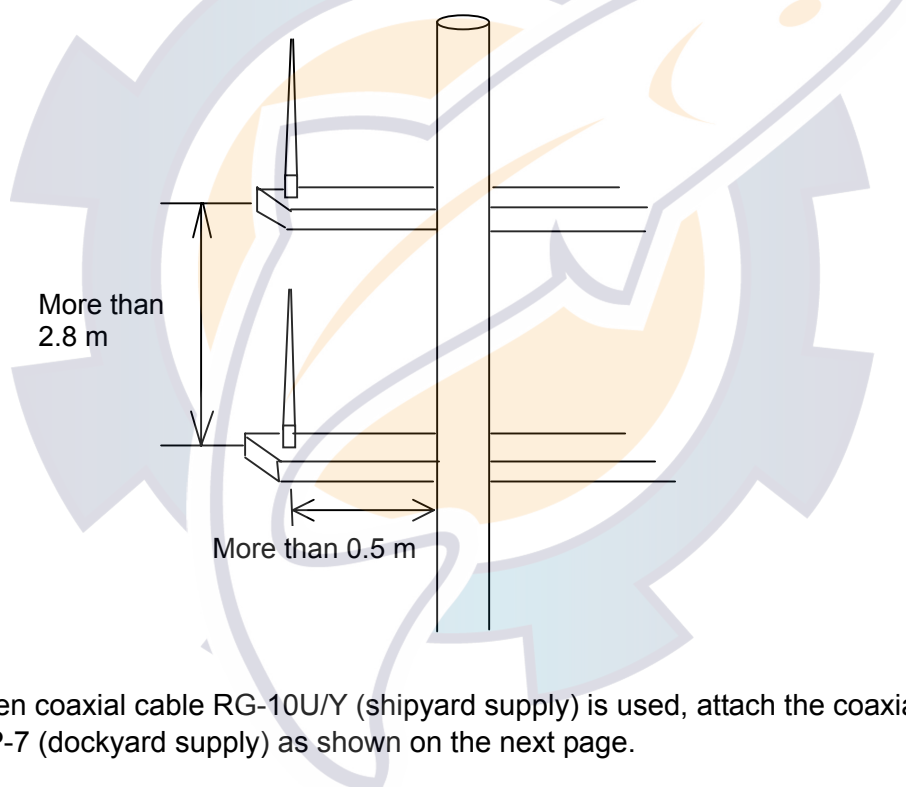
Cabling

- The cable should be kept as short as possible to minimize signal attenuation. Coaxial cables equal to or better than RG10U/Y are recommended.
- All outdoor-installed connectors on coaxial cables should be fitted with preventive isolation such as vulcanizing tape to protect against water penetration into the antenna cable.
- Coaxial cables should be installed in separate signal cable channels/tubes and at least 10 cm away from power supply cables. Crossing of cables should be done at right angles (90°). The minimum bend radius of the coaxial cable should be 5 times the cable's outer diameter.
- Install the VHF whip antenna referring to the outline drawing at the back of this manual. Separate this antenna from other VHF radiotelephone antennas as shown on the next page to prevent interference to the FA-150.

Horizontal separation distance



Vertical separation distance

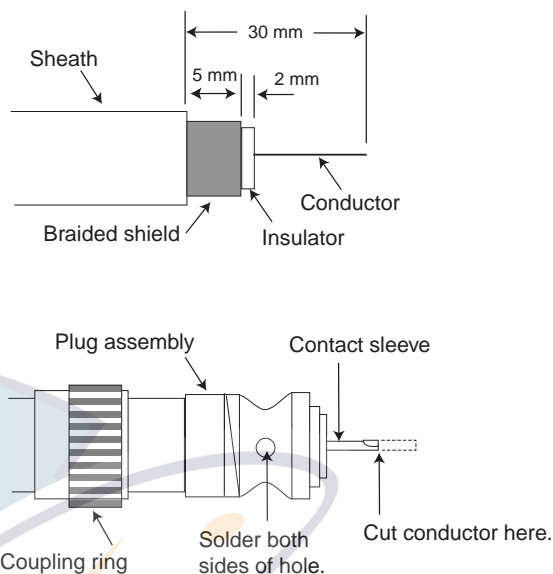


- When coaxial cable RG-10U/Y (shipyard supply) is used, attach the coaxial plug M-P-7 (dockyard supply) as shown on the next page.

How to attach the plug M-P-7

Lay the coaxial cable and attach an M-type plug (if necessary) to the cable as follows.

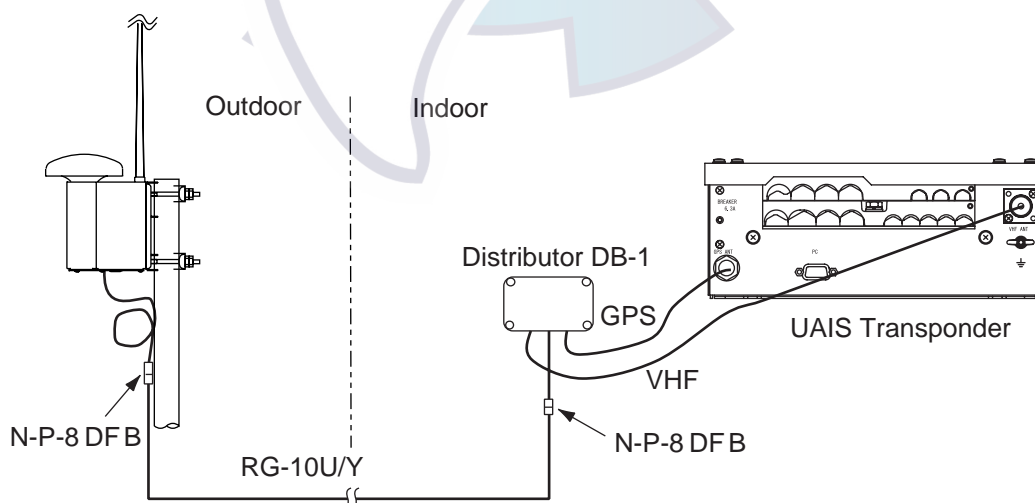
1. Remove the sheath by 30 mm.
2. Bare 23 mm of the center conductor. Trim braided shield by 5 mm and tin.
3. Slide coupling ring onto cable.
4. Screw the plug assembly on the cable.
5. Solder plug assembly to braided shield through solder holes. Solder contact sleeve to conductor.
6. Screw coupling ring into plug assembly.



1.1.3 GPS/VHF combined antenna

Install the combined antenna unit referring to the outline drawing. When selecting a mounting location for the antenna, keep in mind the following points.

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible. Mounting it this way keeps it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.
- Also, refer to the antenna installation guidelines page 3.

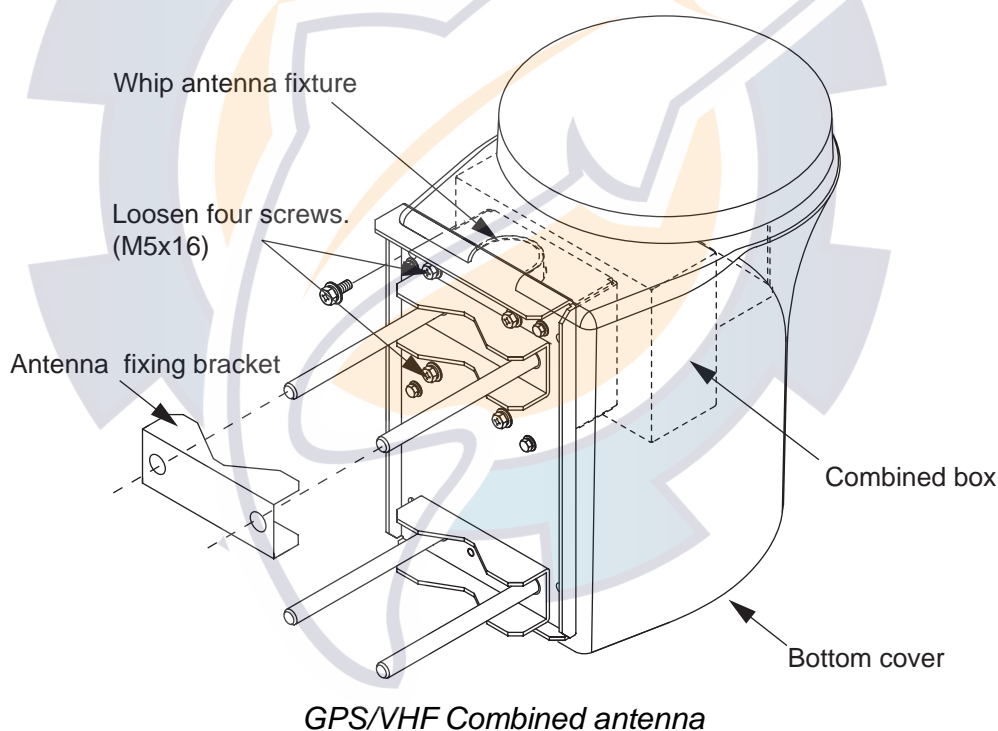


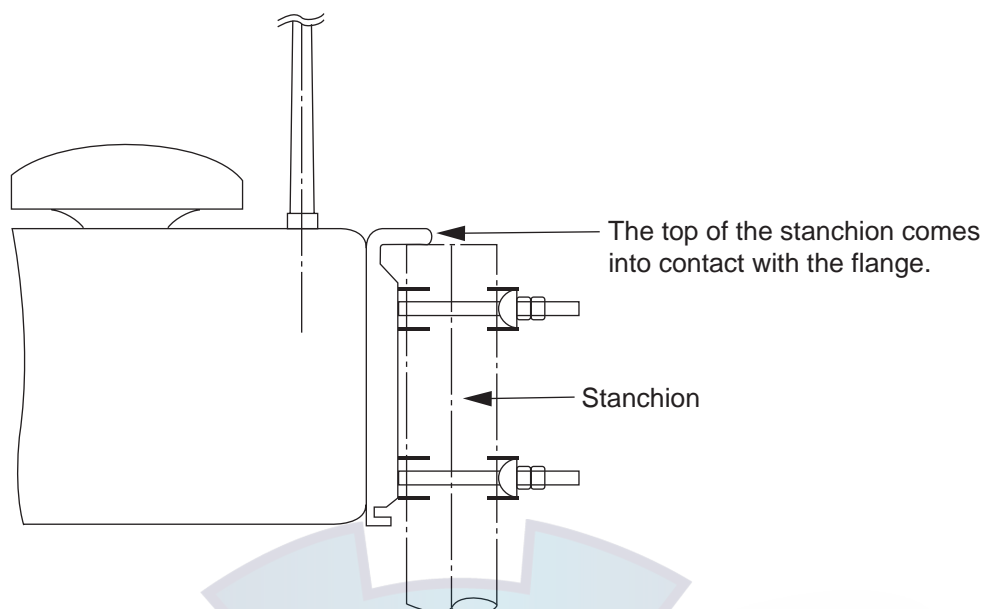
Installation overview of GPS/VHF combined antenna

Mounting procedure

1. Dismount the bottom cover, cut the cable-tie inside the unit and take out the coaxial connector attached to the combined box.
2. Loosen four screws to loosen whip antenna fixture and pull out the coaxial connector coming from the combined box through the hole in the whip antenna fixture.
3. Connect the coaxial connector to the whip antenna base and wrap the junction part of the whip antenna with vulcanizing tape and then vinyl tape for waterproofing.
4. Insert the whip antenna from the top of the combined antenna.
5. Secure the whip antenna with whip antenna fixture.
6. Using a new plastic band (supplied), secure the cables and coaxial connector inside the antenna case.
7. Mount the bottom cover.
8. Fix the GPS/VHF combined antenna to the ship's stanchion (40 to 50 mm diameter) with antenna fixing brackets, flat washers and hex. nuts.

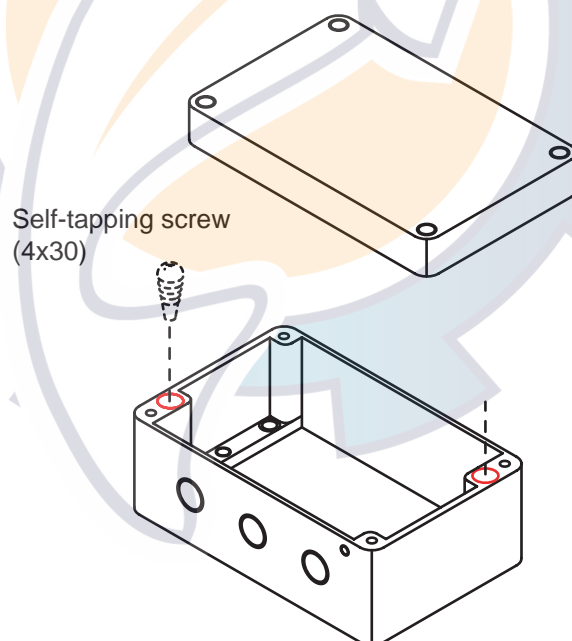
Note: Coat the exposed parts of bolts and nuts with silicon sealant.





Installing distributor unit DB-1

The length of the cable between the distributor unit and transponder unit is 1 m so locate the distributor unit within 1 m from the transponder unit. Fix the distributor unit on the bulkhead, facing the cable entrance downward. Remove the lid of the distributor unit and secure the unit with two self-tapping screws.



Note: Be sure no foreign material or water enters the distributor unit.

1.2 Monitor Unit

The monitor unit can be installed on a desktop or flush mounted in a panel. Install it on the chart table or near the steering place, referring to the outline drawing.

When selecting a mounting location for the monitor unit, keep the following in mind:

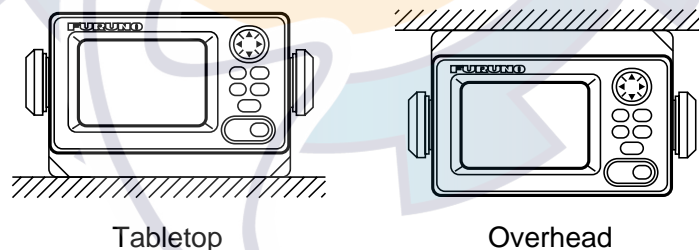
- Keep the unit out of direct sunlight.
- The temperature and humidity should be moderate and stable.
(Operating temperature range: -15°C to +55°C)
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Refer to the outline drawing.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

Standard compass: 0.45 meters

Steering compass: 0.3 meters

Desktop mounting

1. Fasten the hanger with four self-tapping screws (5x20).
2. Fasten the monitor unit to the hanger with two knobs.



Flush mounting

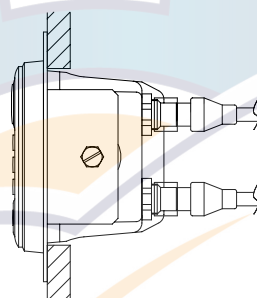
There are two types of flush mount kits, F type and S type. For details, see the outline diagrams at the back of this manual.

F type

Use the optional flush mount kit OP20-29.

Name	Type	Code No.	Qty
Cosmetic panel	20-016-1051	100-251-370-10	1
Self-tapping screw	5x20	000-162-609-10	4
Hexagon-head bolt	M6x12	000-162-897-10	2
Spring washer	M6	000-158-855-10	2

1. Prepare a cutout in the mounting location whose dimensions are 183 (W) x 92 (H) mm.
2. Attach the cosmetic panel (20-016-1051) to the unit with two hex head bolts (M6x12) and two spring washers (M6).
3. Fix the unit to the mounting location with four self-tapping screws (5x20).

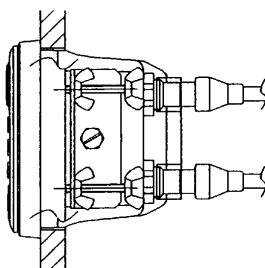


S type

Use the optional flush mount kit OP20-17.

Name	Type	Code No.	Qty
Fixing plate	20-007-2401	100-183-190-10	2
Hexagon-head bolt	M6x12	000-162-897-10	2
Wing bolt	M4x30	000-804-799	4
Wing nut	M4	000-863-306	4
Spring washer	M6	000-158-855-10	2

1. Prepare a cutout in the mounting location whose dimensions are 167 (W) x 92 (H) mm.
2. Insert the unit to the cutout.
3. Attach two fixing plates (20-007-2401) to the unit with two hex bolts (M6x12) and two spring washers (M6).
4. Screw four wing bolts (M4x30) to wing nuts (M4).
5. Fasten the unit with four wing bolts and nuts.



1.3 UAIS Transponder

Mount the transponder, where it is protected from rain and water splash.
This unit can be installed on a bulkhead. Install it, referring to the outline drawing.

When selecting a mounting location for the transponder, keep the following in mind:

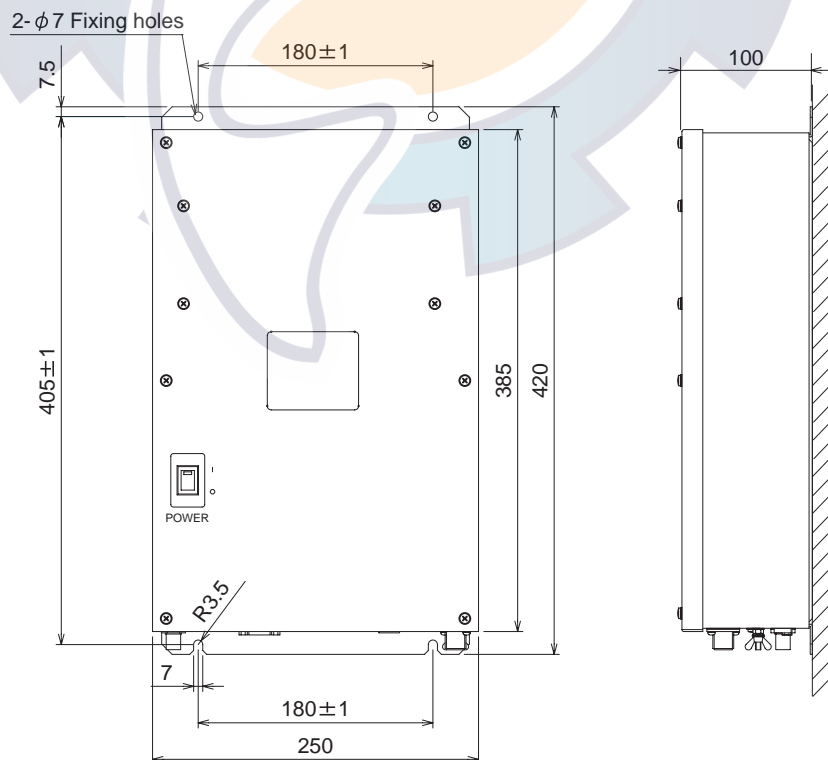
- Keep the transponder out of direct sunlight.
- The temperature and humidity should be moderate and stable.
(Operating temperature range: -15°C to $+55^{\circ}\text{C}$)
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Refer to the outline drawing.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

Standard compass: 1.2 meters

Steering compass: 0.8 meters

Mounting

- Fix the unit with four self-tapping screws.

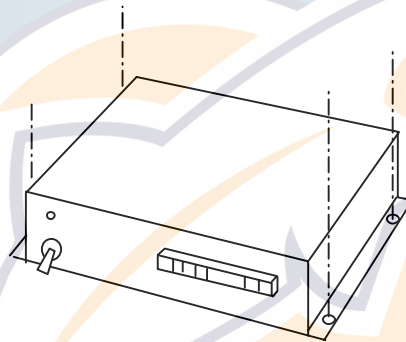


1.4 Power Supply (option)

When selecting a mounting location for the unit, keep the following in mind:

- Keep the unit out away from areas subject to water splash.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:
 - Steering compass: 0.6 m
 - Standard compass: 0.9 m

Fix the unit with four self-tapping screws (4x16) to a desktop or the deck as shown in the figure below. It is not necessary to open the cover.



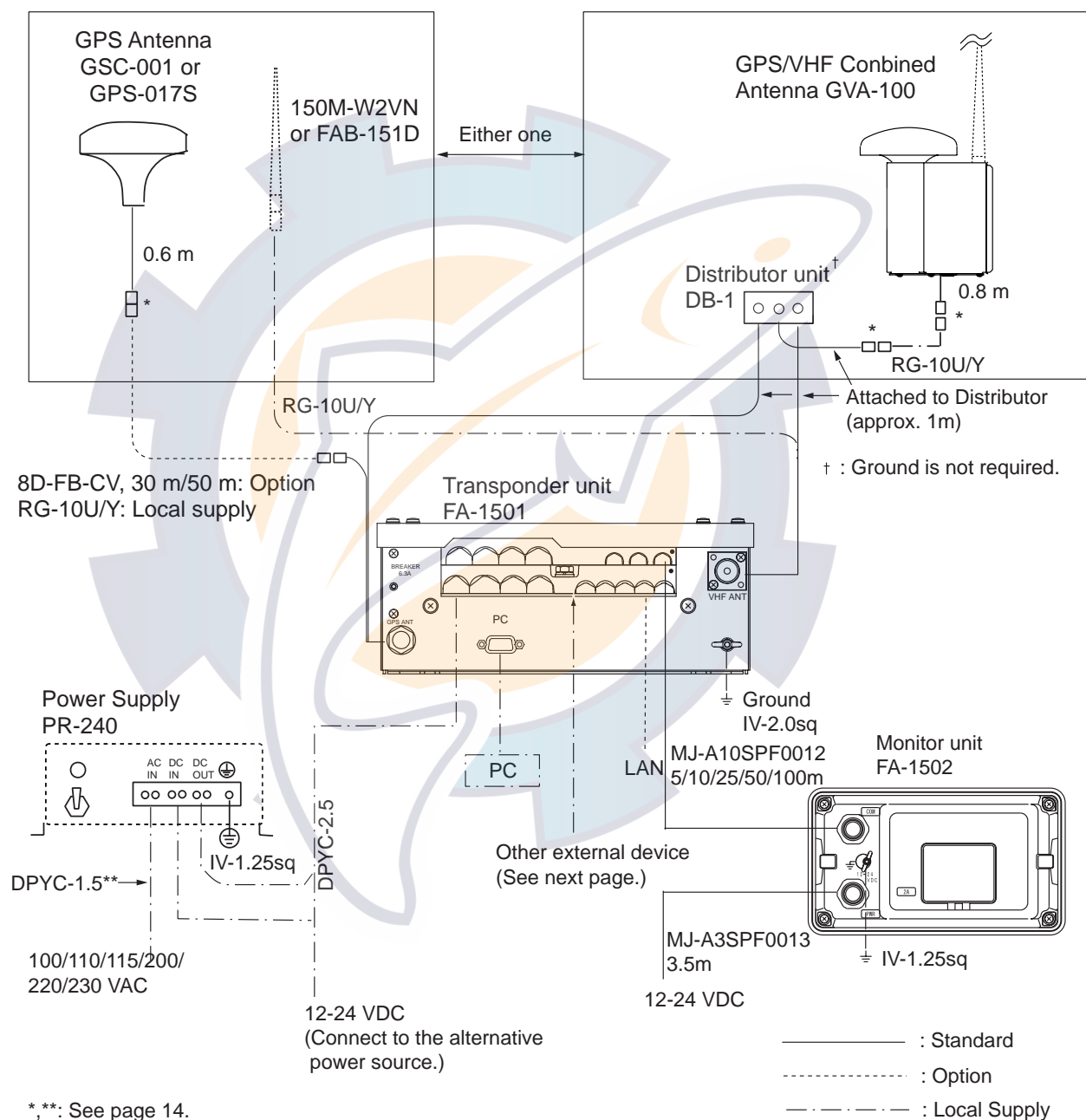
1.5 Pilot Plug (option)

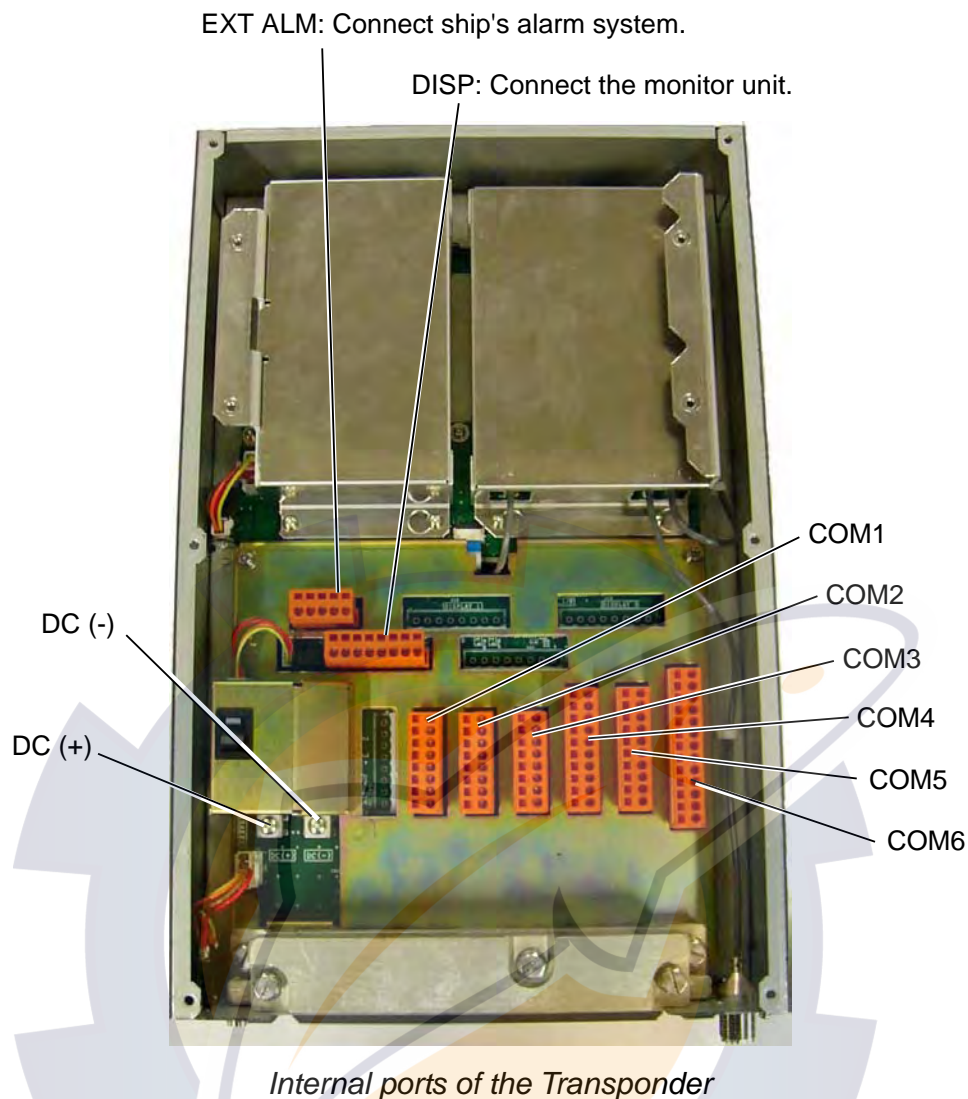
The pilot plug should be mounted near where the pilot steers the ship. This plug is used to connect a PC to display AIS information for use by the pilot. Refer to the outline drawing at the back of this manual for mounting dimensions.

2. WIRING

2.1 Connection

Connect the equipment, referring to the interconnection diagram at the back this manual.



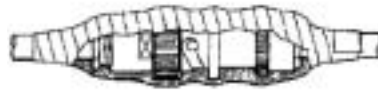


- COM1: Long range communication device (Inmarsat C, etc.) or External display (Radar, ECDIS, Pilot plug)
COM2 & COM3: External display, NAVNET 2, Pilot plug
COM4-COM6: GPS, Gyrocompass, Speedlog, ROT, etc.

Note: A plastic sheet is placed across the cable glands of the transponder to keep out foreign material. Cut out holes in the plastic where cables are to be lead in.

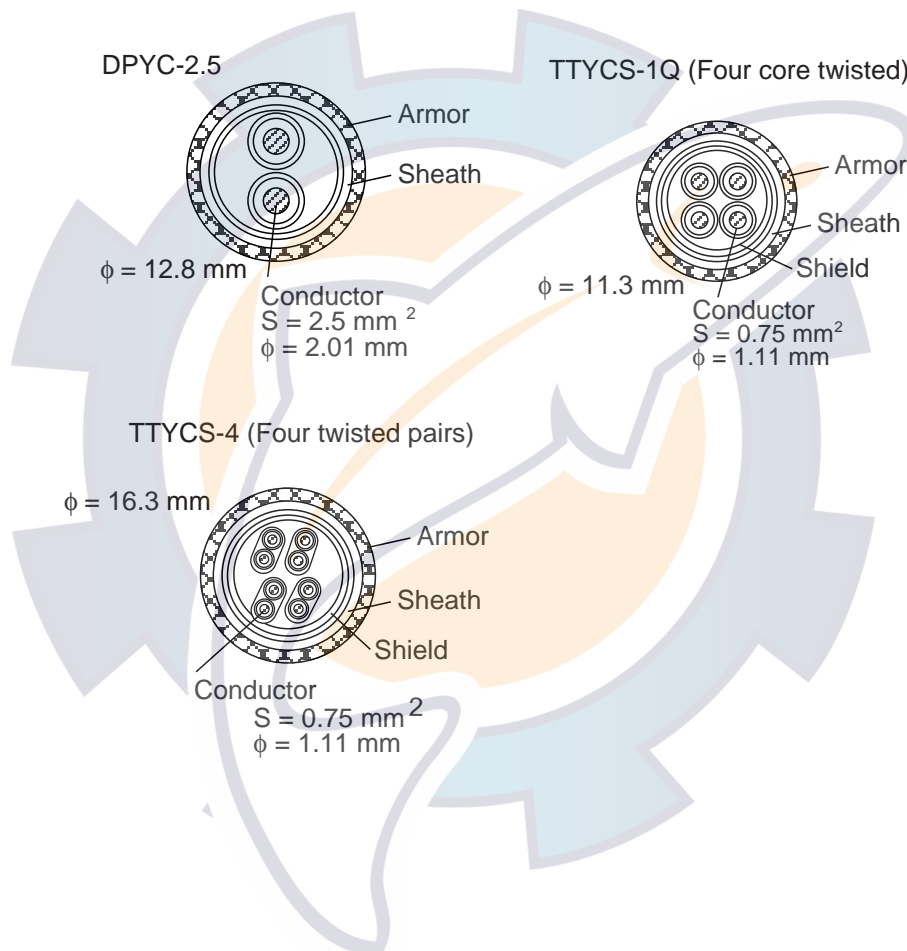
*: Waterproofing connectors

Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with a cable-tie.



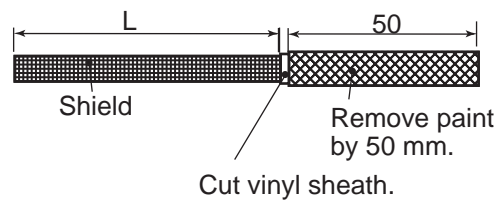
Waterproofing connector

** : DPYC-2.5, TTYCS-1Q and TTYCS-4 are Japan Industry Standard cables.
Use them or the equivalents.

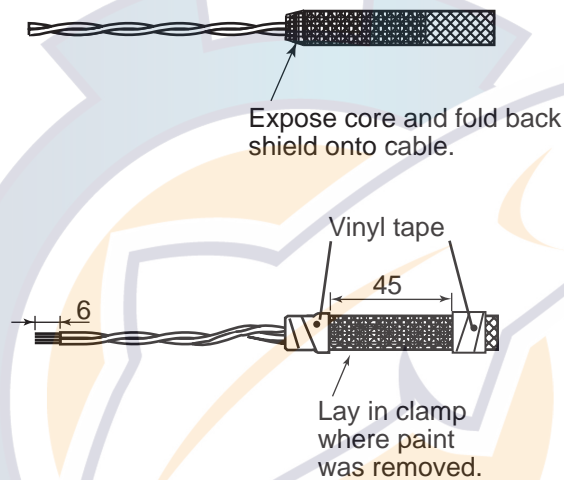


Cable connection at transponder

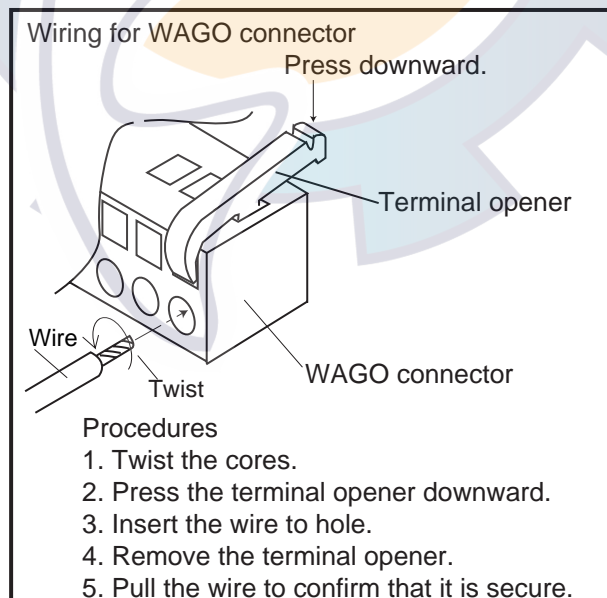
Fabrication of cables TTYCS-4 and TTYCS-1Q



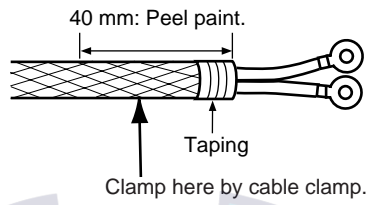
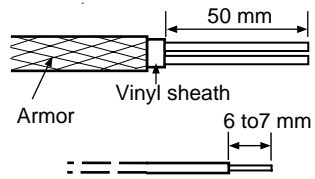
L: Depends on equipment connected.
Measure at the transponder.



Connection



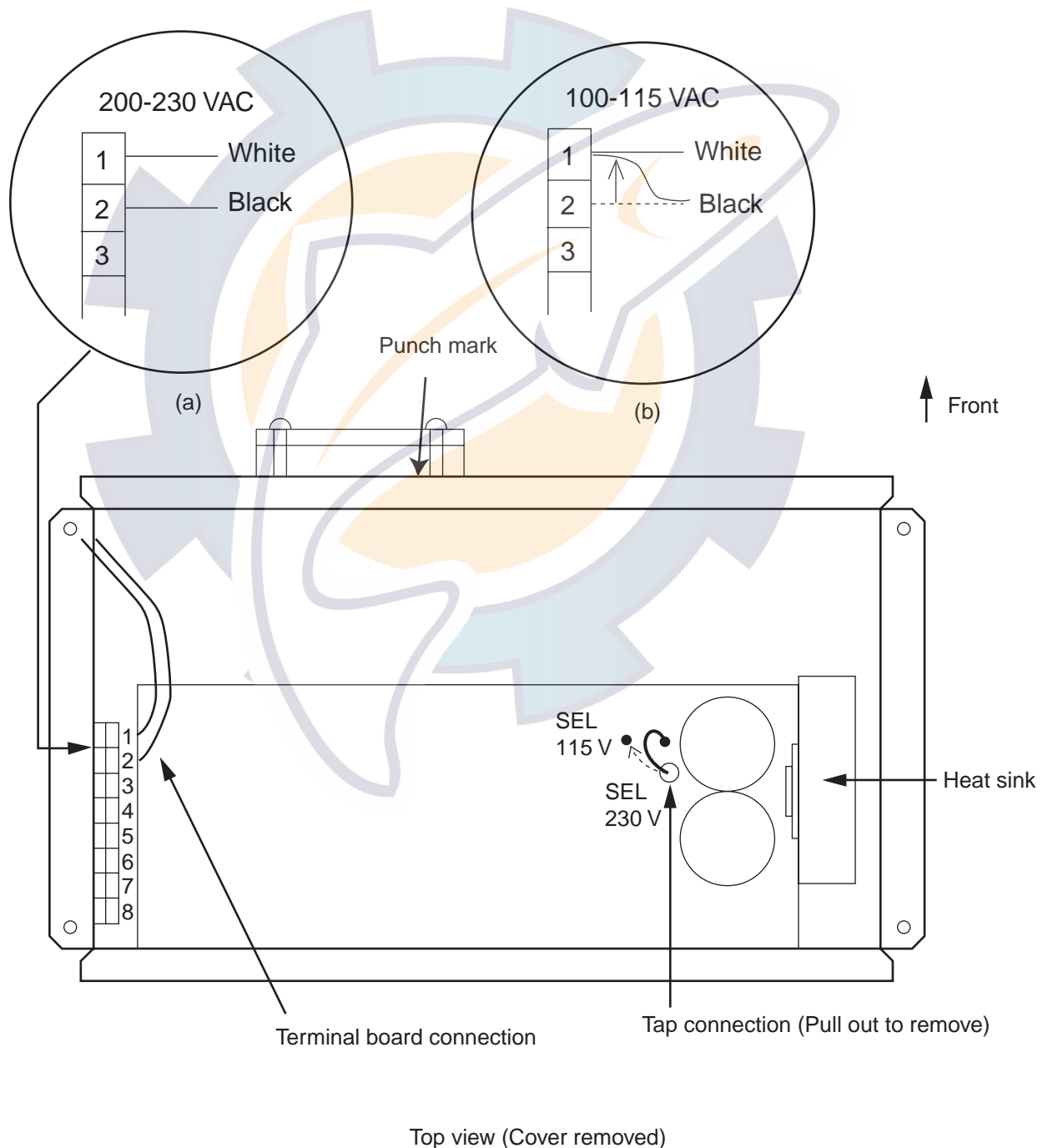
Fabrication of power cable DPYC-2.5



2.2 Changing Ship's Mains Specifications

The power supply PR-240 is shipped ready for connection to a 200-230 VAC ship's mains. If the ship's mains is 100 VAC – 115 VAC, change the tap connection and terminal board connection as below. Attach label supplied as accessories to the punch mark on the front panel according to the ship's mains.

Ship's mains	Tap connection	Terminal board connection #1 & #2
100-115 VAC	SEL 115 V	b
200-230 VAC	SEL 230 V	a

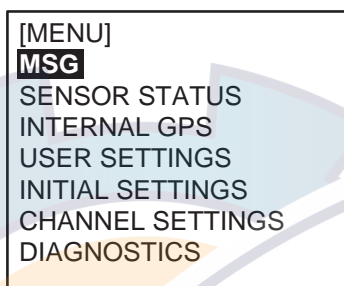


3. SETTING AND ADJUSTMENT

After installing the equipment, set up the own ship's static information (MMSI, IMO number, ship's name, call sign, type of ship and GPS antenna position). Also, set up the I/O ports.

3.1 Setting MMSI, IMO No., Name and Call Sign

1. Press the [MENU] key to open the main menu.

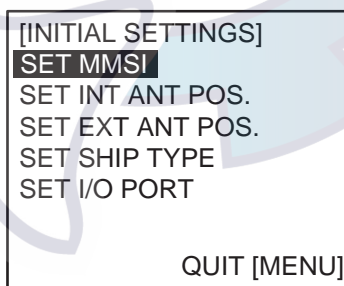


2. Press ▼ on the cursor pad to choose INITIAL SETTINGS and press the [ENT] key. The following password entry window appears.



Password entry window

3. Enter the password. The INITIAL SETTINGS window appears. Note that the password is known by only the FURUNO dealer.



Note that if the password is wrong, "VIEW" is displayed in stead of "SET" in the figure above.

4. SET MMSI is selected; press the [ENT] key to display the SET MMSI window.

[SET MMSI]

MMSI: 000000000

IMO NO: 000000000

NAME:

C. SIN:

QUIT [MENU]

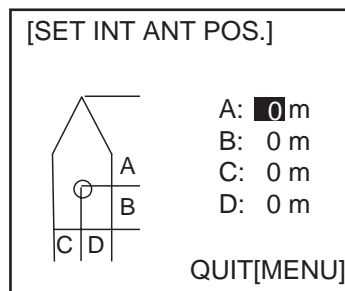
SET MMSI window

5. MMSI is selected; press the [ENT] key. By using the cursor pad, enter ship's MMSI (Maritime Mobile Service Identity) in nine digits. To set value, press ▲ or ▼ key and to change the digit, press ◀ or ▶ key.
6. Press the [ENT] key and the IMO NO is selected.
7. Press the [ENT] key and enter ship's IMO number in nine digits. If the IMO number has 7 digits, enter "0" twice followed by IMO number. If the ship has no IMO number, enter nine zeroes.
8. Press the [ENT] key and the NAME is selected.
9. Press the [ENT] key and enter ship's name, using up to 20 alphanumeric characters.
10. Press the [ENT] key and the C. SIN is selected.
11. Press the [ENT] key and enter call sign, using up to seven alphanumeric characters.
12. Press the [ENT] key.
13. Press the [MENU] key to save the settings.

Note: If you enter incorrect data, do the procedure from step 1.

3.2 Setting GPS Antenna Position

1. Open the INITIAL SETTINGS window, referring to page 18.
2. Press ▲ or ▼ key to choose SET INT ANT POS. and press the [ENT] key.



SET INT ANT POS. sub-menu
(Data entry)

3. Press the [ENT] key again.
4. Enter distance for location "A" of FA-150 GPS antenna by using the cursor pad and press the [ENT] key.
 - A: Distance from bow to GPS antenna position, setting range: 0-511 m
5. Press the [ENT] key and enter distance for location B, C and D similar to how you did for "A" above.
 - B: Distance from stern to GPS antenna position, setting range: 0-511 m
 - C: Distance from port to GPS antenna position, setting range: 0-63 m
 - D: Distance from starboard to GPS antenna position, the setting range: 0-63 m
6. Press the [MENU] key to return to the INITIAL SETTINGS menu.
7. Press ▲ or ▼ key to choose SET EXT ANT POS and press the [ENT] key.
8. Enter distance for location of an external GPS antenna (if connected) similar to how you did for the internal GPS antenna.
9. Finally press the [MENU] key to save the settings.

3.3 Setting Ship Type

1. In the INITIAL SETTINGS window, press the ▲ or ▼ key to choose the SET SHIP TYPE and press the [ENT] key.

```
[SET SHIP TYPE]
TYPE NO : 0*

**** TYPE DETAIL ****
NOT AVAILABLE
```

2. Press the [ENT] key and set number for ship type by using ▲ or ▼ key, referring to the table below.

Table: Ship type

No.	Ship type
1	Future use
2	WIG
3	Vessel
4	HSC
5	Special craft
6	Passenger ships
7	Cargo ships
8	Tanker
9	Other type of ship

WIG: Wing in ground

HSC: High speed craft

(For details, see “§1.5 Setting Up for Voyage” on the operator’s manual.

3. Press the [MENU] key to save the setting.

3.4 Setting I/O Port

Setting COM port/PC port

1. In the INITIAL SETTINGS window, press ▲ or ▼ key to choose the SET I/O PORT and press the [ENT] key.

```
[SET I/O PORT]
SET COM PORT
SET PC PORT
SET LAN PORT*
SET PRIORITY

QUIT[MENU]
```

*: Only when LAN kit (option) attached.

SET I/O PORT menu

2. SET COM PORT is selected; press the [ENT] key.
3. Select an appropriate port among COM1, COM2, COM3, COM4, COM5 and COM6.

If you choose COM1 for example, do as follows.

4. Press the [ENT] key to display the COM1 setting window.

[SET COM1]
 MODE : **LONG RANGE**
 SPEED: IEC 61162-2

QUIT [MENU]

5. Press the [ENT] key again to display the MODE setting window.

[SET COM1]
 MODE : **LONG RANGE**
 SPEED: **LONG RANGE**
 EXT DISPLAY
 DISABLE

QUIT [MENU]

6. Press ▲ or ▼ to choose the device connected and press the [ENT] key.
 LONG RANGE: Long range communication device, for ex. Inmarsat C.
 EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.
 DISABLE: When the port is not used.
7. Press the [ENT] key to display the SPEED setting window.

[SET COM1]
 MODE : LONG RANGE
 SPEED: **IEC 61162-2**
 IEC 61162-1
 IEC 61162-2

QUIT [MENU]

8. Press ▲ or ▼ to choose the data format, or data transmission rate.
 IEC61162-1: 4800 bps
 IEC61162-2: 38.4 Kbps
9. Press the [ENT] key.
10. Press the [MENU] key to save the settings.
11. Set up other ports similarly.
12. Set PC PORT similar to how you did for the COM PORT.

The table below shows the ports and corresponding items to be set.

Port and data format/data transmission rate		
Port	External device (MODE)	Format/Rate (SPEED)
COM1	<u>LONG RANGE</u>	IEC61162-1 <u>IEC61162-2</u>
	EXT DISPLAY	IEC61162-1 <u>IEC61162-2</u>
	DISABLE	-
COM2	<u>EXT DISPLAY</u>	IEC61162-1 <u>IEC61162-2</u>
	MONITOR	IEC61162-1 (No use) <u>IEC61162-2</u>
	HI LEVEL IF	IEC61162-1 (No use) <u>IEC61162-2</u>
	DISABLE	-
COM3	<u>EXT DISPLAY</u>	IEC61162-1 <u>IEC61162-2</u>
	MONITOR	IEC61162-1 (No use) <u>IEC61162-2</u>
	HI LEVEL IF	IEC61162-1 (No use) <u>IEC61162-2</u>
	DISABLE	-
COM4	<u>SENSOR</u>	<u>IEC61162-1</u> IEC61162-2
	EXT DISPLAY	<u>IEC61162-1</u> IEC61162-2
	DISABLE	-
COM5	SENSOR	<u>IEC61162-1</u> IEC61162-2
COM6	SENSOR	<u>IEC61162-1</u> IEC61162-2 AD-10
PC	<u>STANDARD</u>	4800bps, 9600bps 19.2kbps, <u>38.4kbps</u> , 57.6kbps
	MONITOR	4800bps, 9600bps 19.2kbps, <u>38.4kbps</u> , 57.6kbps
	SERVICE	4800bps, 9600bps 19.2kbps, <u>38.4kbps</u> , 57.6kbps
	BEACON	4800bps
	DISABLE	-

Note: Underline shows default.

LONG RANGE: Long range communication device, for ex. Inmarsat C.

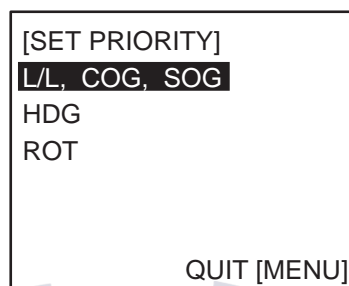
EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.

SENSOR: GPS, Gyrocompass, Speedlog, ROT, etc.

HI LEVEL IF: NAVNET 2

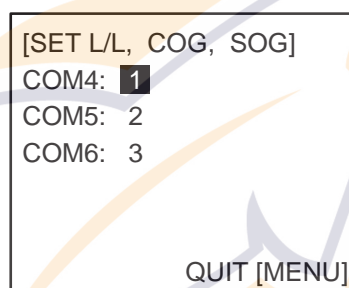
Priority setup

1. Press ▲ or ▼ to choose SET PRIORITY at the SET I/O PORT sub-menu and press the [ENT] key.



PRIORITY menu

2. "L/L, COG, SOG" is selected; press the [ENT] key.



3. COM4 is selected; press the [ENT] key to display the setting window.



4. Choose the priority level for the COM4 port (position, course over ground and speed over ground data) and press the [ENT] key.
 "1" is the highest and "3" is the lowest.
5. Set the priority of COM5 and COM6 similarly.

Note: Do not set same number among COM4, COM5 and COM6.

6. Press the [MENU] key to return to the SET PRIORITY menu.
7. Press ▲ or ▼ to choose HDG and press the [ENT] key.
8. Set the priority for heading data similar to how you did for "L/L, COG, SOG".
9. Press ▲ or ▼ to choose ROT and press the [ENT] key.
10. Set the priority for rate-of-turn data similarly.
11. Press the [MENU] key several times to save the settings.

4. ATTACHING LAN KIT (OPTION)

To connect to PC network or NAVNET 3D network, the optional LAN kit is required.

Name: LAN kit

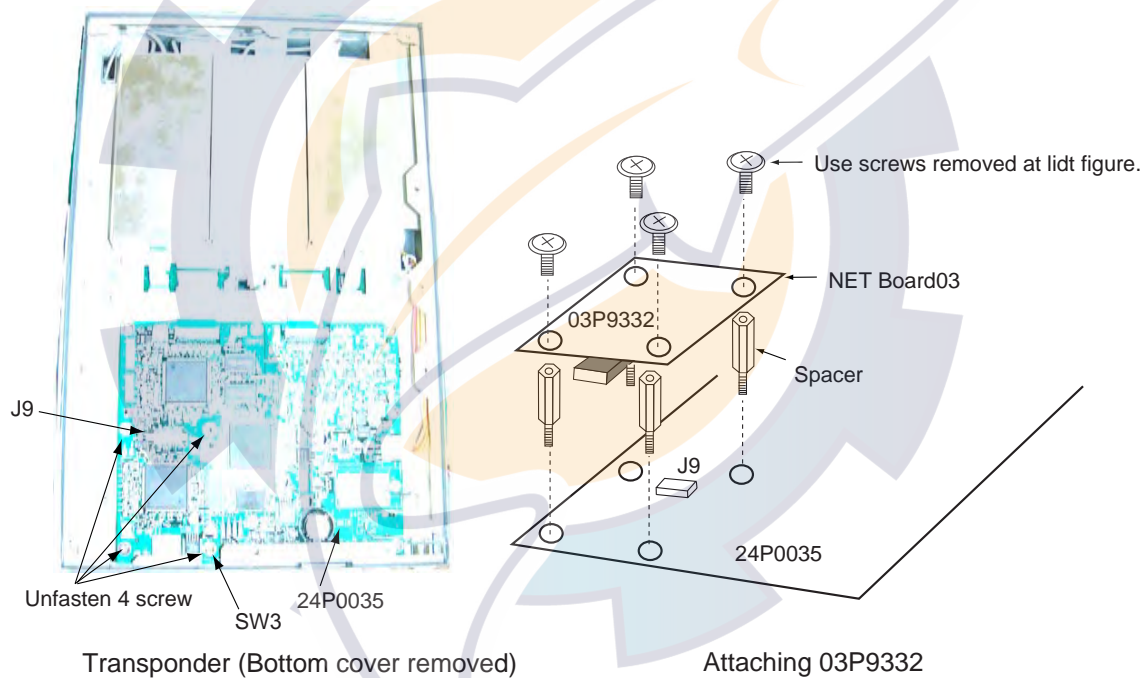
Type: OP24-8

Code no.: 005-956-020

	Name	Code no.	Qty	Remark
1	NET100 board	008-535-840	1	03P9332
2	Hex. spacer	000-801-678	4	

Attaching

1. Dismount the bottom cover.
2. Attach NET100 board 03P9332 to the 24P0035 board, referring to the figure shown below.



3. Set DIP switch SW3 #4 as follows.
 - For NAVNET 3D network: SW3 #4 OFF (default)
 - For PC network: SW3 #4 ON

Setting LAN port for PC network

1. Press the [MENU] key, choose INITIAL SETTING, enter password, choose SET I/O PORT and press the [ENT] key to show the SET I/O PORT sub menu.
2. Press ▲ or ▼ to choose SET LAN PORT and press the [ENT] key.

```
[SET LAN PORT]
MODE : STANDARD
IP ADDRESS
172. 031. 024. 001
SUB NET MASK
255. 255. 000. 000
PORT NO. : 10000
QUIT [MENU]
```

3. Press the [ENT] key to show the mode selecting window.
4. Press ▲ or ▼ to choose suitable mode and press the [ENT] key.
STANDARD: When connecting a LAN device
MONITOR: When connecting a monitor
SERVICE: Data output for service man
DISABLE: No connection
5. Press the [ENT] key, enter IP address in the IP ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
Choose digit with ◀ or ▶; set value with ▲ or ▼.
6. Press the [ENT] key, enter sub net mask in the SUB NET MASK field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
7. Press the [ENT] key, enter port number in the PORT NO. field and press the [ENT] key. (Setting range: 0 to 65535)
8. Press the [MENU] key several times to save the settings and close the menu.

Setting LAN port for NAVNET 3D network

1. Press the [MENU] key, choose INITIAL SETTING, enter password, choose SET I/O PORT and press the [ENT] key to show the SET I/O PORT sub menu.
2. Press ▲ or ▼ to choose SET LAN PORT and press the [ENT] key.

```
[SET LAN PORT]      1/2
IP ADDRESS
172. 031. 024. 001
SUB NET MASK
255. 255. 000. 000
NAVNET PORT NO.
10000
```

3. Press the [ENT] key, enter IP address in the IP ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255) Choose digit with ◀ or ▶; set value with ▲ or ▼.

4. Press the [ENT] key, enter sub net mask in the SUB NET MASK field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
5. Press the [ENT] key, enter port number in the NAVNET PORT NO. field and press the [ENT] key. (Setting range: 10000 to 30000)
6. Press ▼ to show next page.

[SET LAN PORT]2/2

GATEWAY ADDRESS

000. 000. 000. 000

HOST NAME : AIS0

AISOUTPUT : CONTINUOUS

GPSOUTPUT : AUTO

ZDAOUTPUT : AUTO

7. Press the [ENT] key, enter gateway address in the GATEWAY ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
8. At the HOST NAME field, enter host name that is used in the NAVNET 3D(Setting range: AIS 0 to AIS 9) .
9. At the AIS OUTPUT field, set output condition.
AUTO: Auto-detect of where to output AIS data.
CONTINUOUS: AIS Output AIS data continuously.
10. At the GPS OUTPUT field, set GPS data (L/L, SOF, COG) output condition between AUTO and CONTINUOUS.
11. At the ZDA OUTPUT field, set time data output condition between AUTO and CONTINUOUS.
12. Press the [MENU] key several times to save the settings and close the menu.

5. IEC 61162-1/2 DATA SENTENCES

IEC 61162-1/2 format data is input or output from the data port COM1-COM6. The table below shows the input/output data specifications.

Transponder

Port	Menu setting	Input/Output	Data format
COM1	LONG RANGE	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM2	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM3	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM4	SENSOR	Input*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
	EXT DISPLAY	Input/Output*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM5	SENSOR	Input*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps)
COM6	SENSOR	Input*	IEC61162-2 (38.4kbps) / IEC61162-1 (4800bps) AD-10

*: See next page for details.

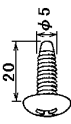
Input data/Sentences

Sentence (Priority)	Contents
ABM	Addressed binary and safety related message
ACA	AIS regional channel assignment message
ACK	Acknowledge alarm
AIR	AIS interrogation request
BBM	UAIS broadcast binary message
VSD	UAIS voyage static data
LRI	Long Range interrogation
LRF	Long Range function
DTM	Datum reference
GNS>GLL>GGA>RMC	Position
VBW>RMC>VTG>OSD	Speed over ground
RMC>VTG>OSD	Course over ground
HDT>OSD>AD-10 format	Heading
GBS	GNSS satellite fault detection
ROT>Calculated value	Rate of turn
SSD	UAIS ship static data

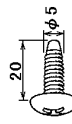
Output data/Sentences

Sentence	Contents
AIVDM	VHF data-link message
AIVDO	UAIS VHF data-link own-vessel report
AIABK	UAIS addressed and binary broadcast acknowledgement
AILRF	Long-range function
AILR1	Long-range reply with destination for function request "A"
AILR2	Long-range reply for function requests "B, C, E and F"
AILR3	Long-range reply for function requests "I, O, P, U and W"
AIACA	AIS regional channel assignment message
AIALR	Set alarm state
AITXT	Text transmission
AIACS	Channel management information source

FURUNO

CODE NO.		005-955-940	24AC-X-9405 -1
TYPE		CPI4-06001	1/1
工事材料表			
For FA-1502			
INSTALLATION MATERIALS			
番号 NO.	名称 NAME	略 図 OUTLINE	用途／備考 REMARKS
1	＋トラップレックス 1種 SELF-TAPPING SCREW		数量 Q'TY 4
		型名／規格 DESCRIPTIONS 5X20 SUS304	CODE NO. 000-802-081

FURUNO

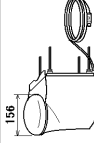


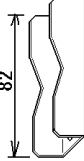


CODE NO.		005-956-010-00	24AC-X-9402 -2
TYPE		CP24-00501	1/1
工事材料表			
For FA-1501			
INSTALLATION MATERIALS			
番号 NO.	名称 NAME	略 図 OUTLINE	用途／備考 REMARKS
1	＋トラップレックス 1½ SELF-TAPPING SCREW		数量 Q'TY 4
		型名／規格 DESCRIPTIONS 5X20 SUS304	CODE NO. 000-162-608-10

型式／コード番号が2段の場合、下段より上段に代わる標準製品であり、どちらが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST

GVA-100, GVA-100-T

A-3
24AA-X-9853 -5 1/1

NAME		OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット				
複合空中線部			GVA-100	1
GPS/VHF COMBINED ANTENNA			000-053-810-00 **	
工事材料		INSTALLATION MATERIALS		
コネクタ (N)			N-P-80FB 座金	2
CONNECTOR			000-140-463-00	
コンベックス			CV-200HT	2
PLASTIC BAND			CV-200HT 000-162-191-10 000-809-226-00	
アンテナ取付金具			24-003-3015-0	2
ANTENNA FIXING BRACKET			100-302-670-00	
ミカ 平座金			M8 SUS304	4
FLAT WASHER			000-864-130-00	
六角ナット 1 種			M8 SUS304	8
HEX. NUT			000-863-110-00	

1.コード番号末尾の「*」は、選択品の代表型式/コードを表します。
CODE NUMBER ENDING WITH “*” INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

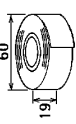




型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

24AA-X-9853

FURUNO

工事材料表

For GPA-017S/GSC-001

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 QTY	用途/備考 REMARKS
INSTALLATION MATERIALS					
1	ビニールテープ NO360 VINYL TAPE		0.2X19X10000 7m 1x20 CODE NO. 000-835-215-00	1	
2	変換ケーブル組品 CONVERT CABLE ASSY.		NJ-TP-3DXV-1 CODE NO. 000-123-809-00	1	
3	コネクタ (N) CONNECTOR		N-P-80FB 座金付き CODE NO. 000-140-463-00	2	
4	コネクタ (TNC-N) CONNECTOR		TNCP-NJ CODE NO. 000-155-599-10	1	
5	絶縁テープ SELF-BONDING TAPE		UF-7 0.5X19X5M UF-7 0.5X19X5M CODE NO. 000-165-833-10 000-800-985-00	1	

型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO., LTD.


24AC-X-9403

A-4

FURUNO

工事材料表

INSTALLATION MATERIALS

工事材料表			For DB-1			
INSTALLATION MATERIALS			略 図 OUTLINE	型 名／規格 DESCRIPTIONS	数量 Q'TY	用 途／備考 REMARKS
番 号 NO.	名 称 NAME					
1	＋ネジ 型名：JAS-J SELF-TAPPING SCREW					
			4X30 SUS304 1/2		2	
				CODE NO.	000-809-321	


CODE NO.	005-950-730	24AA-X-9404 -0	1/1
TYPE	CP24-00101		

For DB-1

FURUNO

付属品表

ACCESSORIES

付属品表			For FA-1502		
ACCESSORIES					
番号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 QTY	用途／備考 REMARKS
1	保護カバー COVER		20-016-1091-2	1	
			CODE NO. 100-297-032		

CODE NO.	004-366-960	24AC-X-9501 -0	1/1
TYPE	FPI4-02801		

For FA-1502

24AA-X-9404

FURUNO ELECTRIC CO., LTD.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)


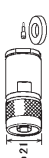
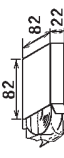
24AC-X-9501

FURUNO ELECTRIC CO., LTD.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

Antenna Cable Set

- CP20-00300 (000-041-938)
- CP20-00310 (000-041-939)

FURUNO

工事材料表		CODE NO.	005-955-570-00	24AC-X-9401 -1	1/1
		TYPE	CP24-00301		
INSTALLATION MATERIALS					
番号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ビニテープ VINYL TAPE		NO360 0.2X19X10000 CODE NO. 000-335-215-00	1	
2	コネクタ (N) CONNECTOR		N-P-80DFB-CF CODE NO. 000-156-918-10 U-F-7 0.5X19X5M U-F-7 0.5X19X5M CODE NO. 000-165-833-10 000-300-305-00	1	
3	絶縁テープ SELF-BONDING TAPE			1	

FURUNO



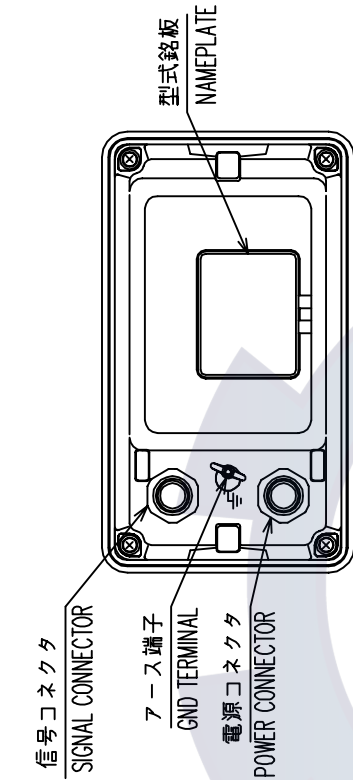
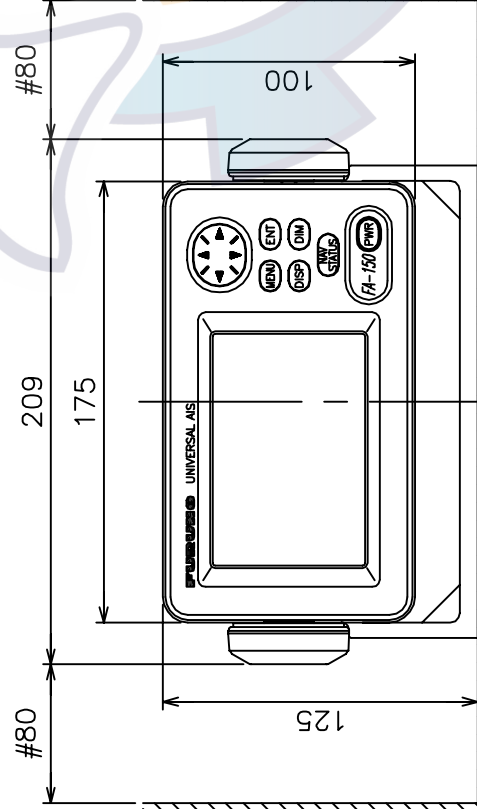
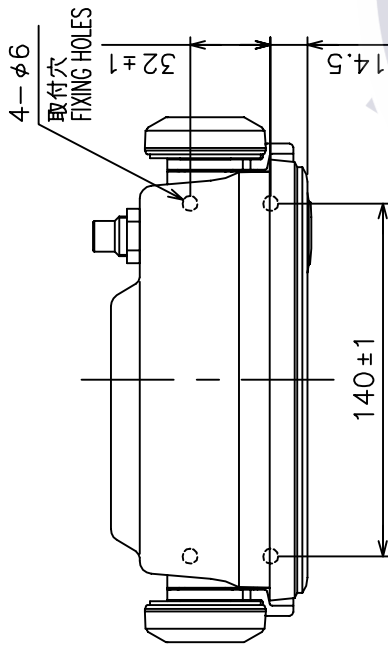
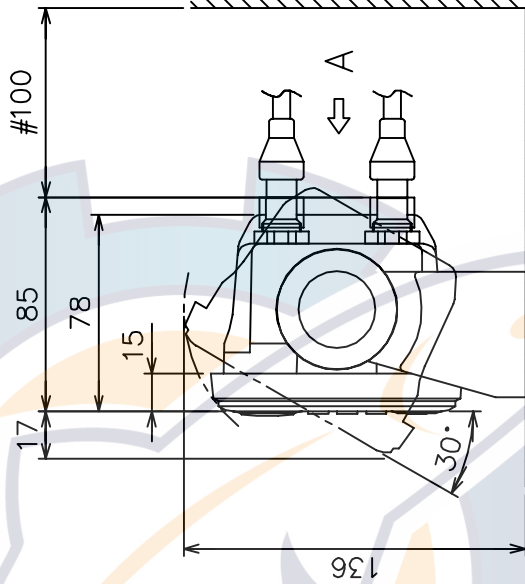
工事材料表			GP-3100/3050, GP-188/3100MARK-2, GP-3300		
INSTALLATION MATERIALS					
番号 NO.	名称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	アンテナケーブル組品 CABLE ASSY.	 L=50M	8D-FB-CV *50M* CODE NO. 000-117-599	1	選択 TO BE SELECTED
2	アンテナケーブル組品 ANTENNA CABLE ASSY.	 L=30M	8D-FB-CV *30M* CODE NO. 000-111-547	1	選択 TO BE SELECTED

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3



矢視 A VIEW A

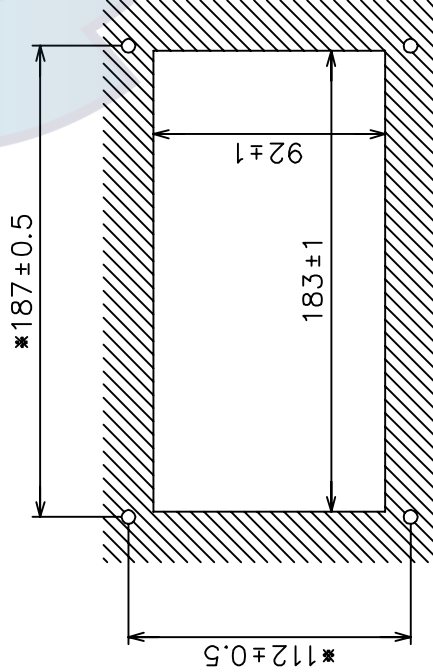
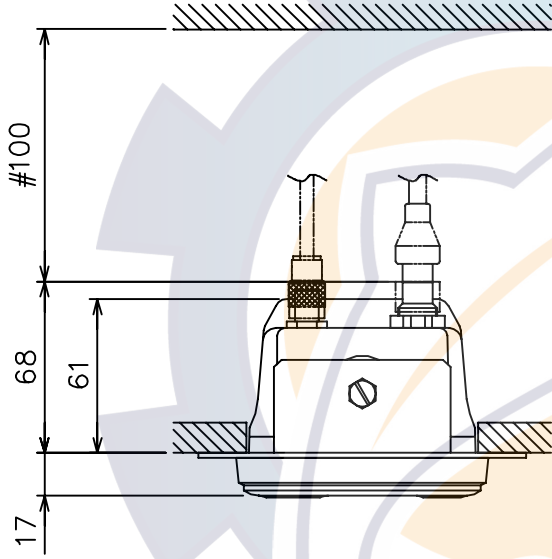
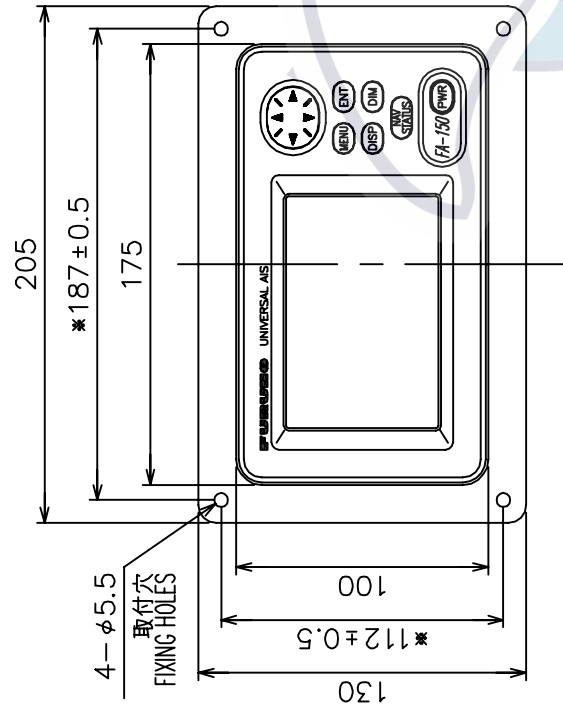


- 注 記
- 1) 指定外寸公差は表 1 による。
 - 2) # 印寸法は最小サービス空間寸法とする。
 - 3) 取付用ネジはトラスタップネジ呼び径 5 × 2.0 を使用のこと。
 - 4) 装備ケーブルはサービス時、表示部を前方に十分引き出せるよう余裕を持たせること。
- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
 2. # MINIMUM SERVICE CLEARANCE.
 3. USE SELF-TAPPING SCREWS 5X2.0 FOR FIXING THE UNIT.
 4. LEAVE ENOUGH SLACK IN CABLEING SO UNIT CAN BE DRAWN FORWARD WITHOUT DISCONNECTING CABLEING.

DRAWN	Dec. 14, '04 E. MIYOSHI	TITLE	FA-1502
CHECKED	TAKAHASHI, T	名称	表示部 (卓上装備)
APPROVED	Y. Hatai	外寸図	
SCALE	1/3	NAME	MONITOR UNIT (TABLETOP MOUNT)
DWG No.	C4431-G01-C		OUTLINE DRAWING

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3



取付穴寸法図
CUTOUT DIMENSIONS

- 注 記 1) # 印寸法は最小サービス空間寸法とする。
2) 指定外寸法公差は表 1 による。
3) 取付用ネジはトラスツピネジ呼び径5×20を使用のこと。
4) * 印寸法は取付穴位置寸法とする。

NOTE 1. # : MINIMUM SERVICE CLEARANCE.

2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

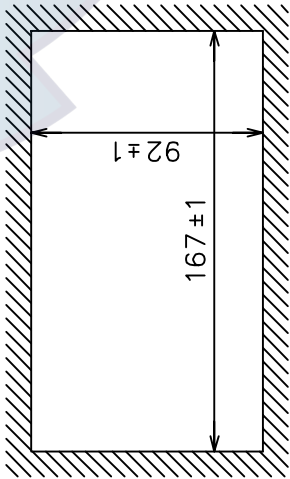
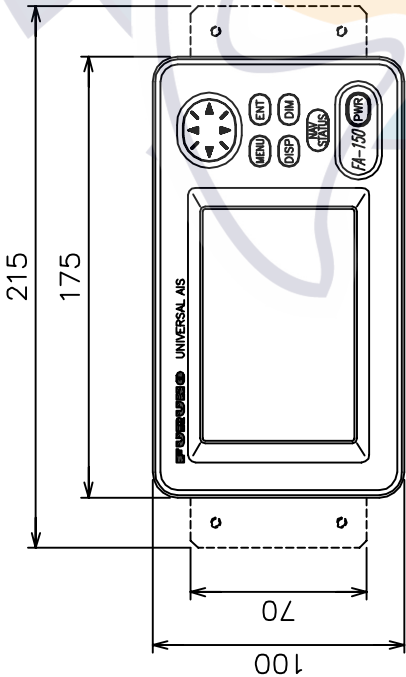
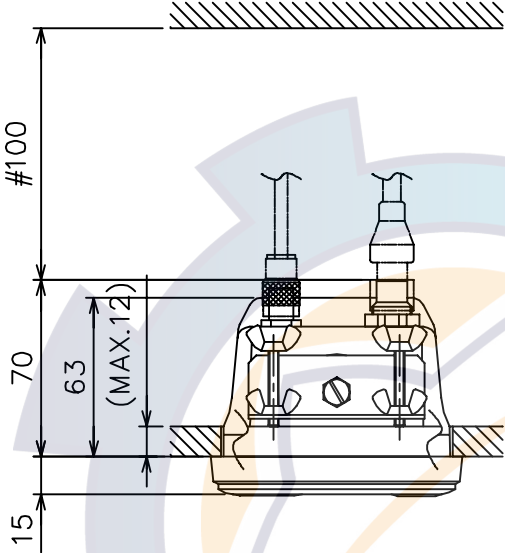
3. USE SELF-TAPPING SCREWS 5x20 FOR FIXING THE UNIT.

4. * : DIMENSIONS FOR FIXING HOLE POSITIONS.

DRAWN	MAY 16, '05 E. MIYOSHI	TITLE	FA-1502
CHECKED	TAKAHASHI, T	名称	表示部(埋込装備F)
APPROVED	Y. Hatai	FA-150	外寸図
SCALE	1/3 MASS ±10% 0.54 kg	NAME	MONITOR UNIT (FLUSH MOUNT F)
DWG.No.	C4431-G03-B	24-006-310G-0	OUTLINE DRAWING

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3



注 記 1) #印寸法は最小サービス空間寸法とする。
2) 指定外の寸法公差は表 1 による。
NOTE 1. # MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

取付穴寸法図
CUTOOUT DIMENSIONS

DRAWN	Feb. 16, '05	E. MIYOSHI	TITLE	FA-1502
CHECKED		TAKAHASHI, T	名称	表示部(埋込装備S)
APPROVED		Y. Hatai	FA-150	外寸図
SCALE	1/3	MASS ±10% 0.56 kg	NAME	MONITOR UNIT (FLUSH MOUNT S)
DWG.No.	C4431-G04-A	24-006-320G-0		OUTLINE DRAWING

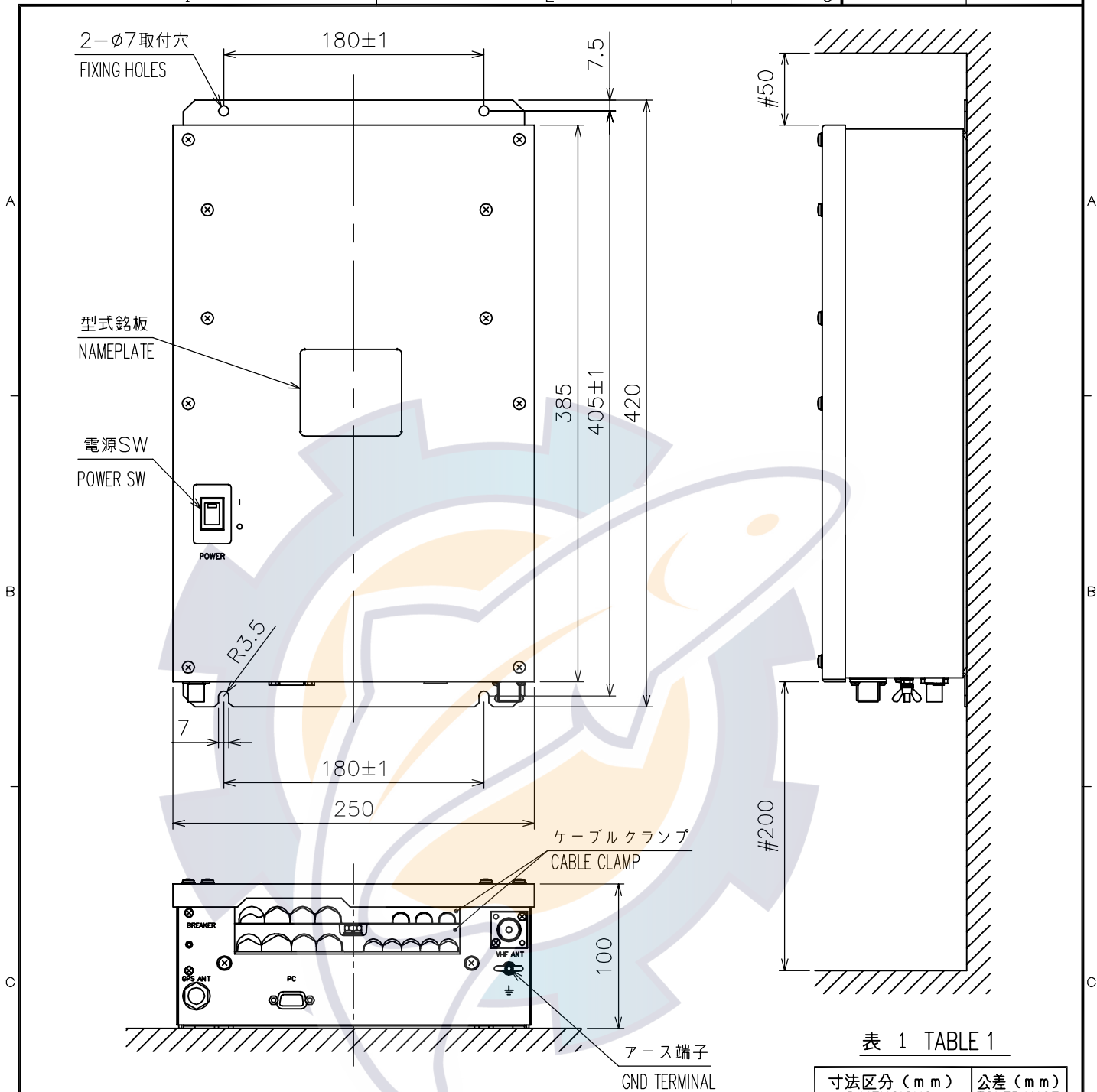


表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3

- 注 記 1) 指定外の寸法公差は表 1 による。
2) #印寸法は最小サービス空間寸法とする。
3) 取付用ネジはM5ボルト、またはタッピンネジ呼び径5X20を使用のこと。

- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M5 BOLTS OR SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.

DRAWN	Nov. 22, '04 E. MIYOSHI	TITLE	FA-1501
CHECKED	TAKAHASHI. T	名称	トランスポンダ部
APPROVED	Y. Hatai	FA-150	外寸図
SCALE	1/4 MASS 7.3 ±10% kg	NAME	TRANSPONDER UNIT
DWG.No.	C4431-G02- B	24-006-110G- 1	OUTLINE DRAWING

A
B
C
D

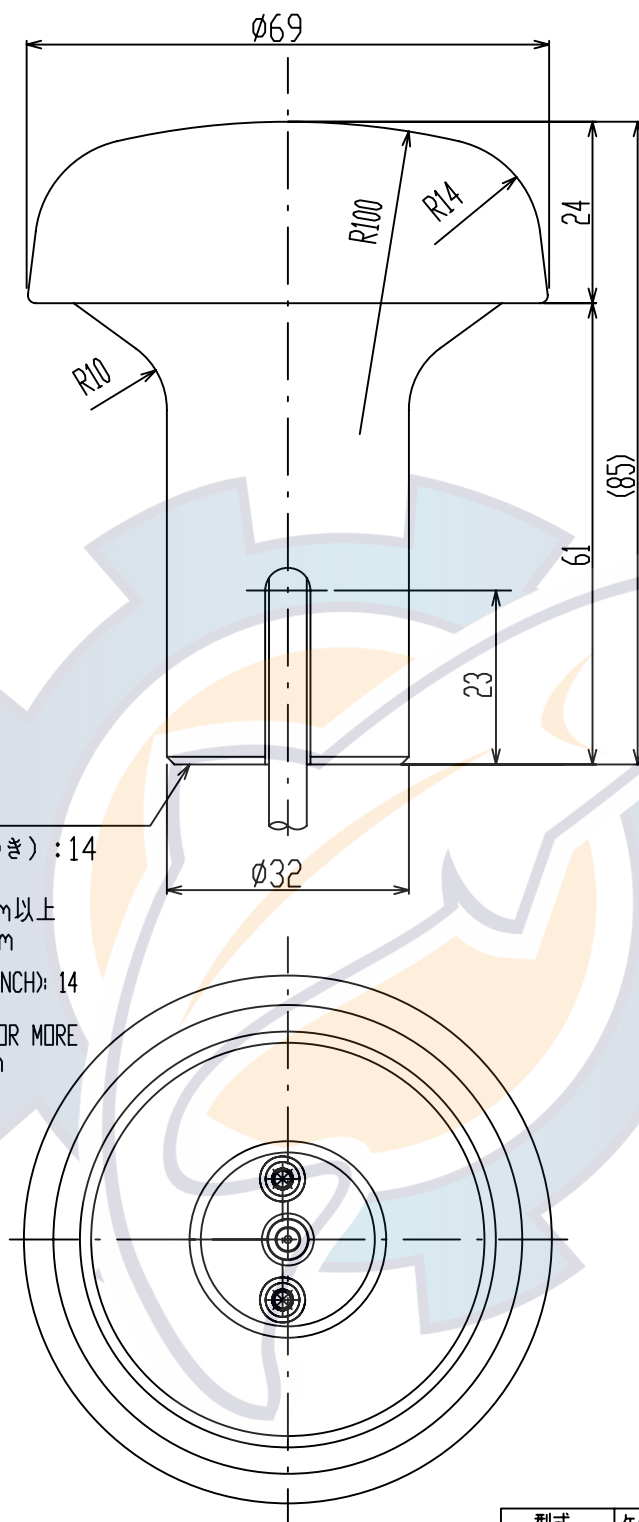


表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3

1-14UNS1B

ねじ山数 (25.4mmにつき) : 14
ピッチ: 1.8143 mm
オネジ有効長さ: 19 mm以上
オネジ有効径: 24.17mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17mm

表2 TABLE 2

型式 TYPE	ケーブル長(m) CABLE LENGTH	プラグ PLAG	質量(kg $\pm 10\%$) MASS
GPA-017	10	TNC-P-3	0.6
GPA-017S	0.2	TNC-J-3	0.15

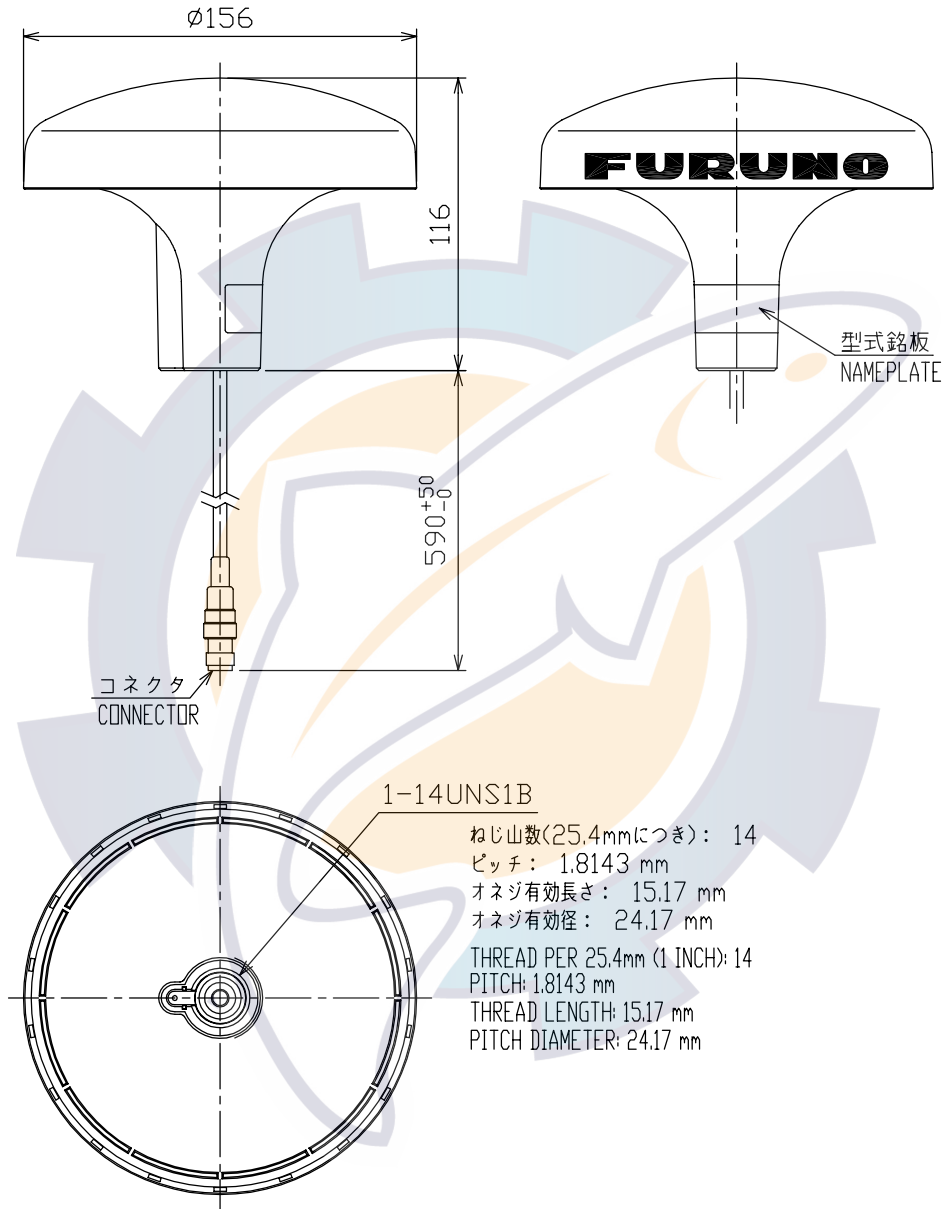
注記
指定外の寸法公差は表1による。

NOTE
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN	Mar. 27 '07 T.YAMASAKI	TITLE	GPA-017/017S
CHECKED	Mar. 27 '07 T.TAKENO	名称	空中線部
APPROVED	Mar. 27 '07 R.Esumi		外寸図
SCALE	1/1	NAME	ANTENNA UNIT
DWG.No.	C4384-G04- L		OUTLINE DRAWING

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3

表 1 TABLE 1



注 記 1) 指定外の寸法公差は表 1 による。
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENDIONS.

DRAWN May 12 '03 T. YAMASAKI		TITLE GSC-001-FA
CHECKED May 12 '03 T. Matsuguchi		名称 GPS アンテナ部
APPROVED May 20 '03 T. Matsuguchi	FA-100	外寸図
SCALE 1/3	MASS $\pm 10\%$ 0.47 kg	NAME GPS ANTENNA UNIT
DWG.No. C4417-G07- B	24-003-330G-0	OUTLINE DRAWING

表 1 TABLE 1

寸法区分 (mm) DIMENSIONS	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3
$500 < L \leq 1000$	± 4
$1000 < L \leq 2000$	± 5

FAB-151D

GSC-001

φ155

1245±15

236±5

169

アンテナ支柱 (φ40~φ50)
STANCHION

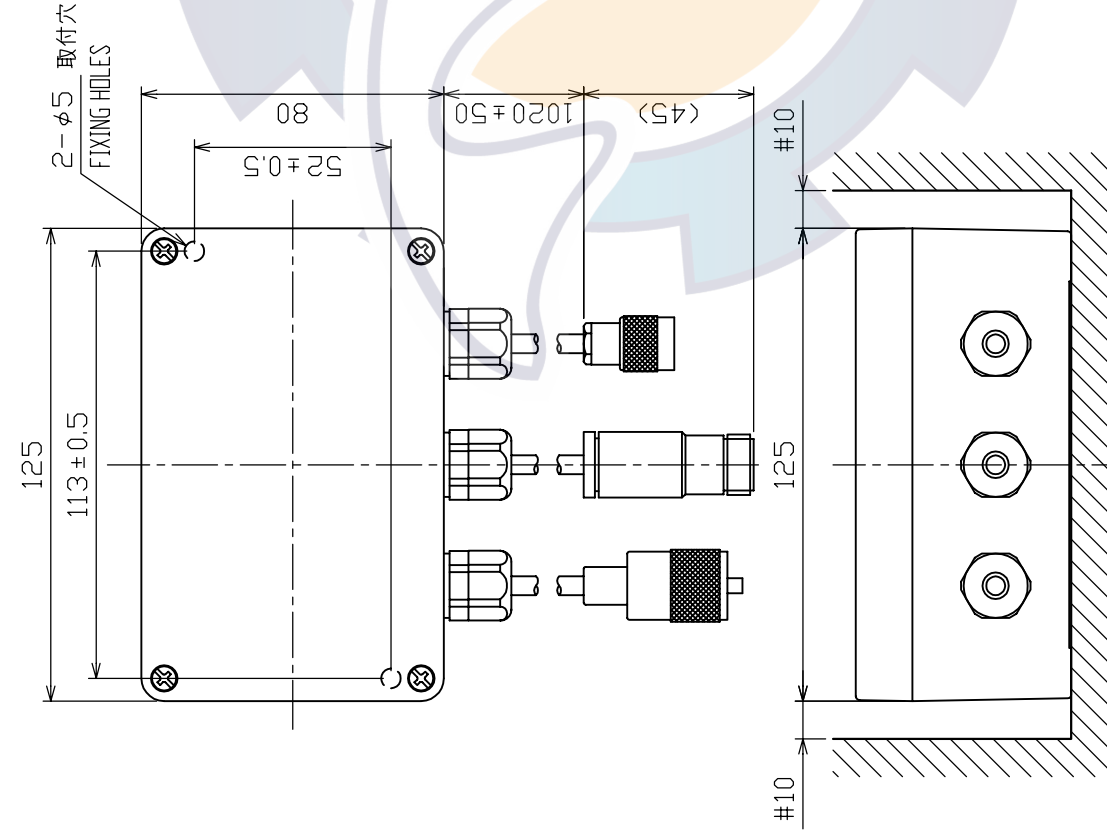
この点より上に金属物体が
突出しないようにすること。
NO METAL OBJECTS SHOULD
BE BEYOND THIS POINT.

4-M8

注 記 1) 指定外の寸法公差は表 1 による。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN Feb. 9 '05 T.YAMASAKI		TITLE GVA-100
CHECKED Feb. 9 '05 T.MATSUGUCHI		名称 GPS/VHF 複合空中線部
APPROVED Feb. 22 '05 T.Matsuguchi	FA-100	外寸図
SCALE 1/10	MASS 3.3 ±10% kg	NAME GPS/VHF COMBINED ANTENNA
DWG.No. C4417-G02-F	24-003-301G-1	OUTLINE DRAWING



寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3

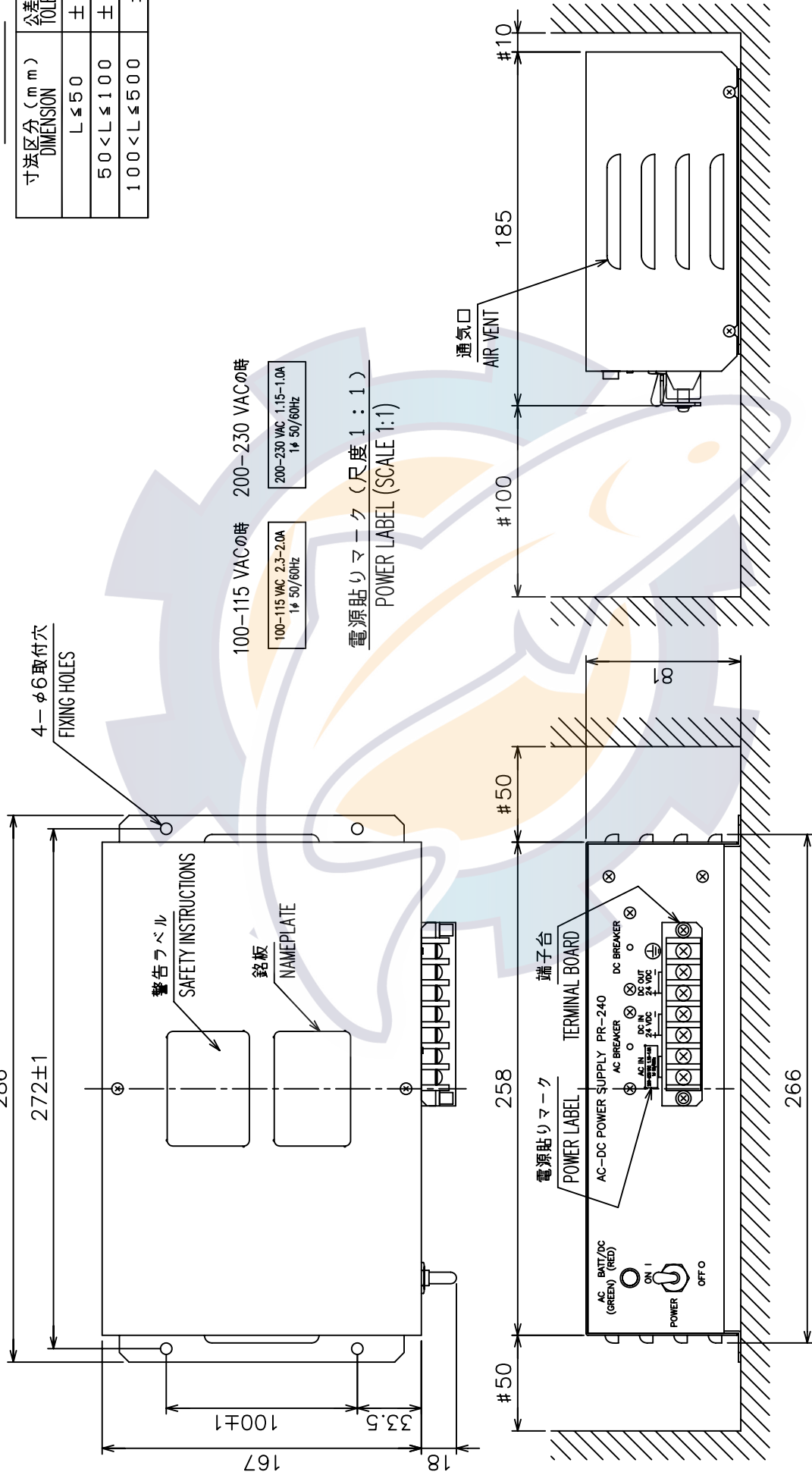
表 1 TABLE 1

- 注 記 1) # 印寸法は最小サービスクリアランスとする。
2) 指定外の寸法公差は表 1 による。
3) 取付用ネジは + ナベタップピンネジ 4 × 3.0 を使用のこと。
- NOTE 1. # RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 4x3.0 FOR FIXING THE UNIT.

DRAWN	Jan. 9 '03	T. YAMASAKI	TITLE	DB-1
CHECKED	Jan. 9 '03	Y. KIMURA	名称	分配器
APPROVED	Jan. 9 '03	Y. Kimura	外寸図	
SCALE	1/2	MASS 0.85 kg	NAME	DISTRIBUTOR
DWG No.	C4417-G04-C	24-003-320G-4	OUTLINE DRAWING	

表 1 TABLE 1

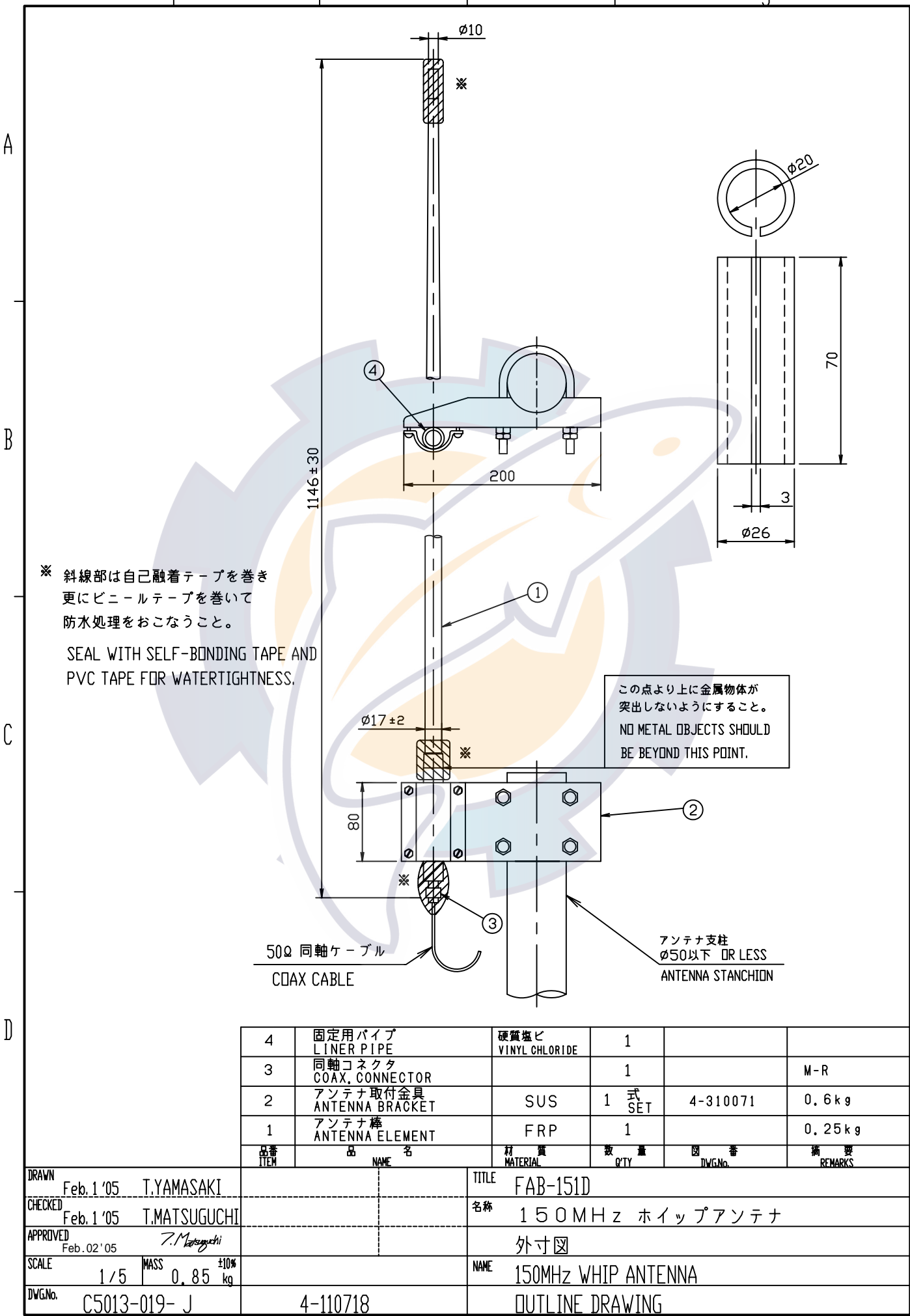
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	± 1.5
50 < L ≤ 100	± 2.5
100 < L ≤ 500	± 3



注 記 1) 指定なき寸法公差は表 1 による。
2) #印寸法は推奨する最小サービス空間寸法とする。
3) 取付用ネジは+トラスタッピンネジ 呼び径 4 × 1.6 を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. # MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS φ4x1.6 FOR FIXING THE UNIT.

DRAWN	Apr. 19 '07 I. YAMASAKI	TITLE	PR-240
CHECKED	Apr. 19 '07 T. TAKENO	名#	AC/DC 電源ユニット
APPROVED	Apr. 20 '07 R. Esumi	外寸図	
SCALE	1/3	NAME	AC/DC POWER SUPPLY UNIT
DWG No.	C5003-G03-G	REF. No.	24-003-500G-3

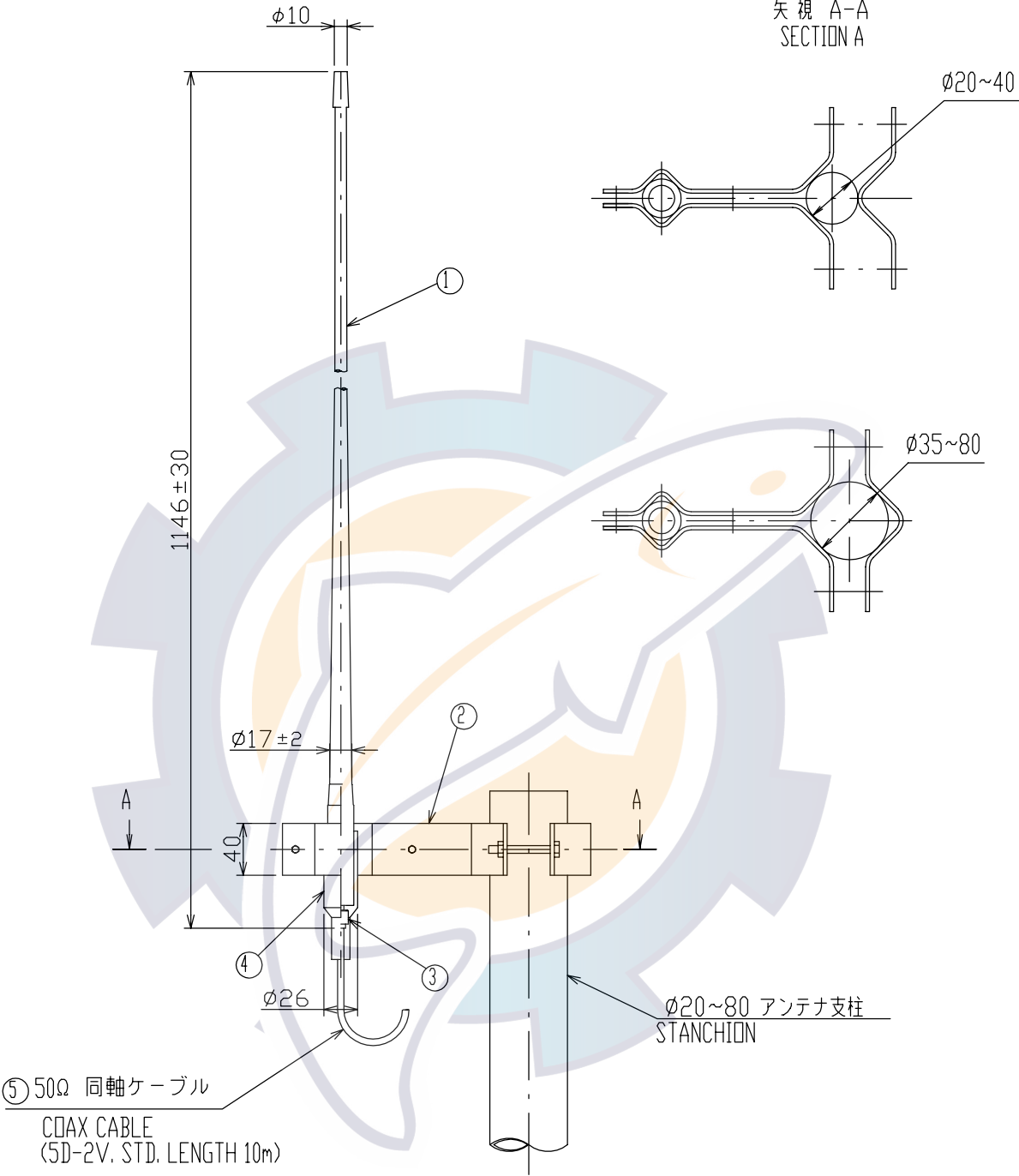


A

B

C

D



5	同軸ケーブル 50Ω COAX. CABLE		10m	5D-2V	
4	コネクタキャップ CONNECTOR CAP		1		
3	同軸コネクタ COAX. CONNECTOR		2	M-P-5	
2	アンテナ取付金具 ANTENNA BRACKET		1 式 SET		t2
1	アンテナ棒 ANTENNA ELEMENT	FRP	1	150M-W2VN	0.25kg
品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWGNo.	摘要 REMARKS

DRAWN Nov. 26 '03 T.YAMASAKI

CHECKED Nov. 26 '03 T.TAKENO

APPROVED Nov. 28 '03 Masaguchi

SCALE 1/5 MASS 0.7 ±10% kg

DWGNo. C5011-042- C

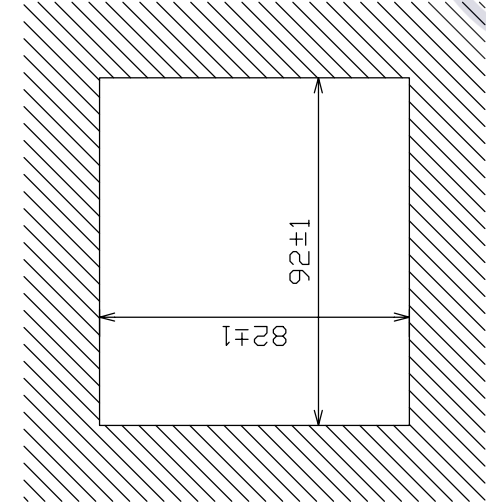
TITLE 150M-W2VN

名称 150MHzホイップアンテナ

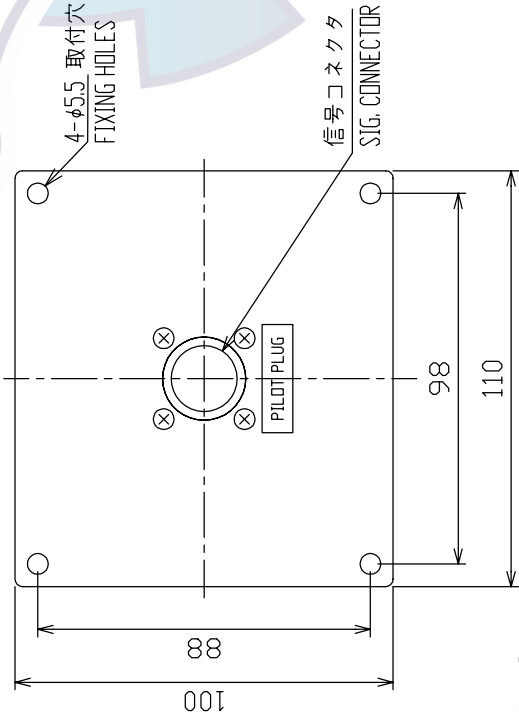
外寸図

NAME 150MHz WHIP ANTENNA

OUTLINE DRAWING



取付寸法図（参考図） CUTOFF DIMENSIONS



注 記

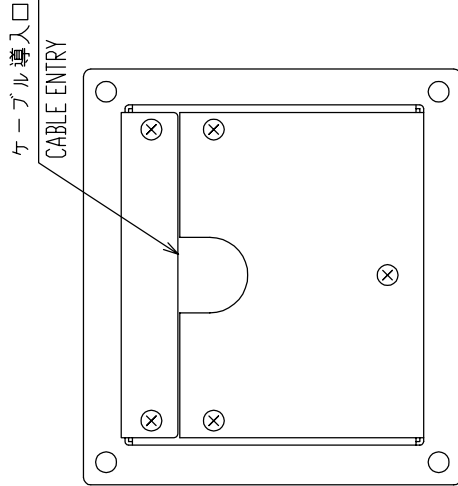
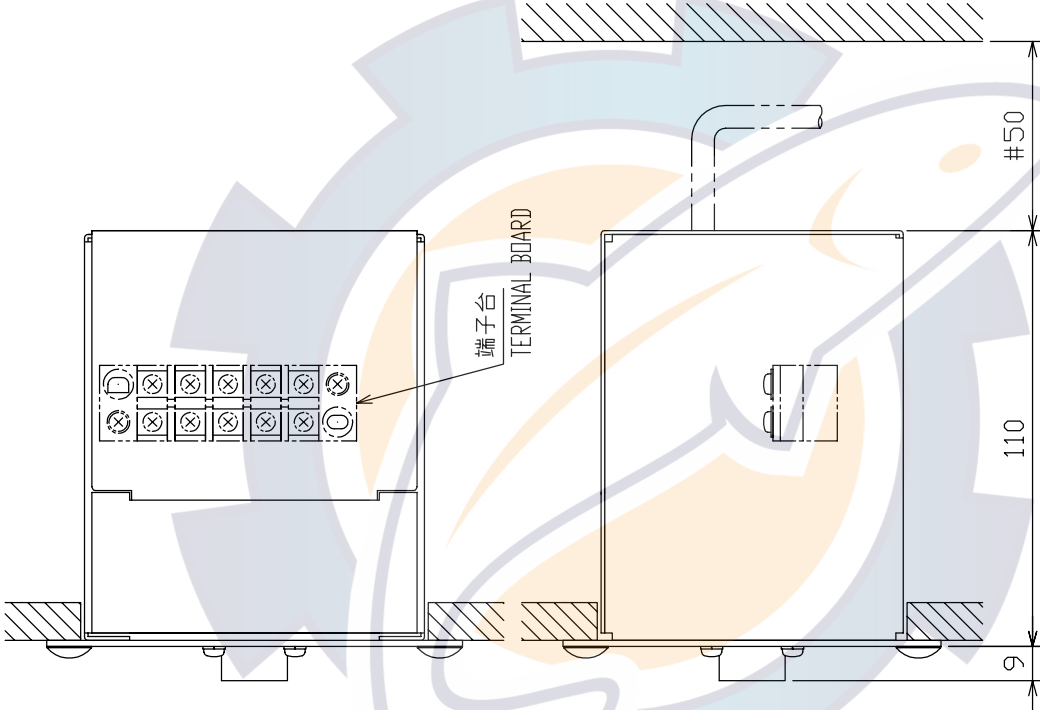
- 1) # 印寸法は推奨するサービス空間寸法。
- 2) 指定外の寸法公差は表 1 による。
- 3) 取付には M5 ボルト、またはトラスタッピンネジ呼び径 5 を使用のこと。

NOTE

1. # RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE M5 BOLTS OR TAPPING SCREWS $\phi 5$ FOR FIXING THE UNIT.

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	± 1.5
$50 < L \leq 100$	± 2.5
$100 < L \leq 500$	± 3

表 1 TABLE 1



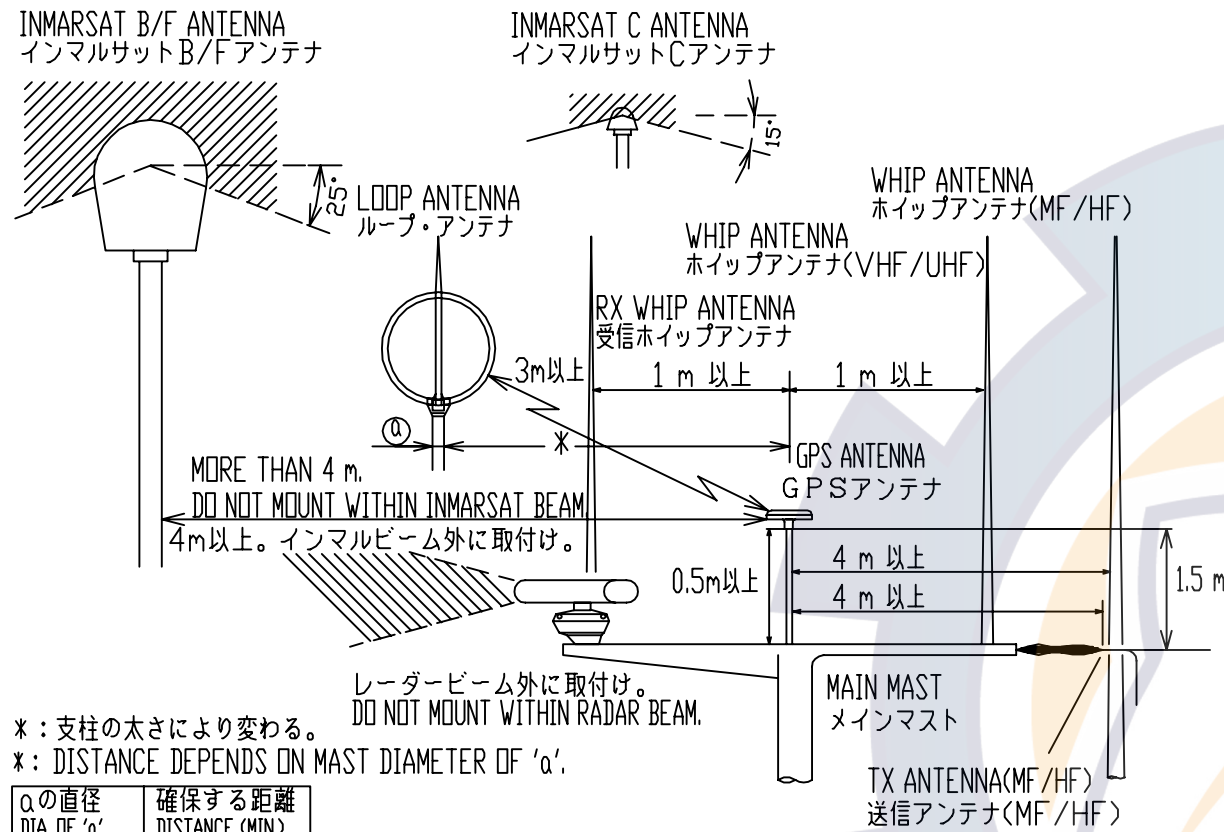
DRAWN	Oct. 2 '03	T. YAMASAKI	TITLE	DP24-3
CHECKED	Oct. 2 '03	I. MATSUGUCHI	名称	パイロットプラグユニット
APPROVED	Oct. 02 '03	Y. Haseguchi	外寸図	
SCALE	1/2	MASS 0.58 kg	NAME	PILOT PLUG UNIT
DWG. No.	C4417-G08-D	24-003-420G-1	OUTLINE DRAWING	

取付位置

MOUNTING LOCATION

他の機器のアンテナから下の図の距離以上離す。

THIS FIGURE SHOWS THE SEPARATION DISTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.

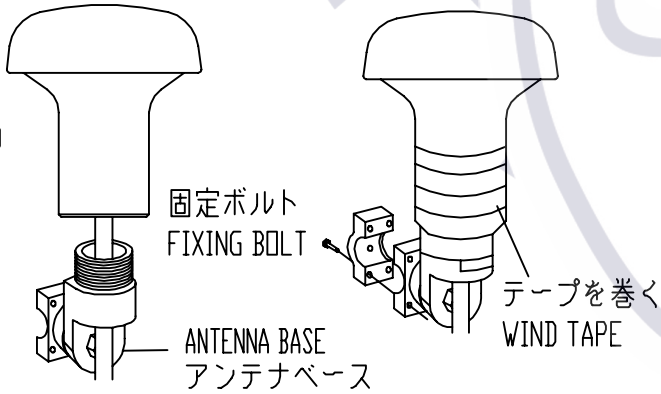


B) スタクションやパルピットにつけるときの

レール用アンテナベース No.13-RC5160
(取付可能レール直径: $\phi 19 \sim \phi 32$)
(コード番号: 000-806-114)

HANDRAIL MOUNTING

USE HANDRAIL MOUNTING BASE No.13-RC5160
(CODE No.000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE
FROM $\phi 19\text{mm}$ TO $\phi 32\text{mm}$.



注記 1) パイプやアンテナベースはアンテナユニットにねじ込んだ後に固定する。

2) アンテナを固定するときはパイプ(アンテナベース)をアンテナにねじ込むこと。
アンテナ側をねじるとコネクタ部やケーブルに無理がかかり、故障の原因となる。

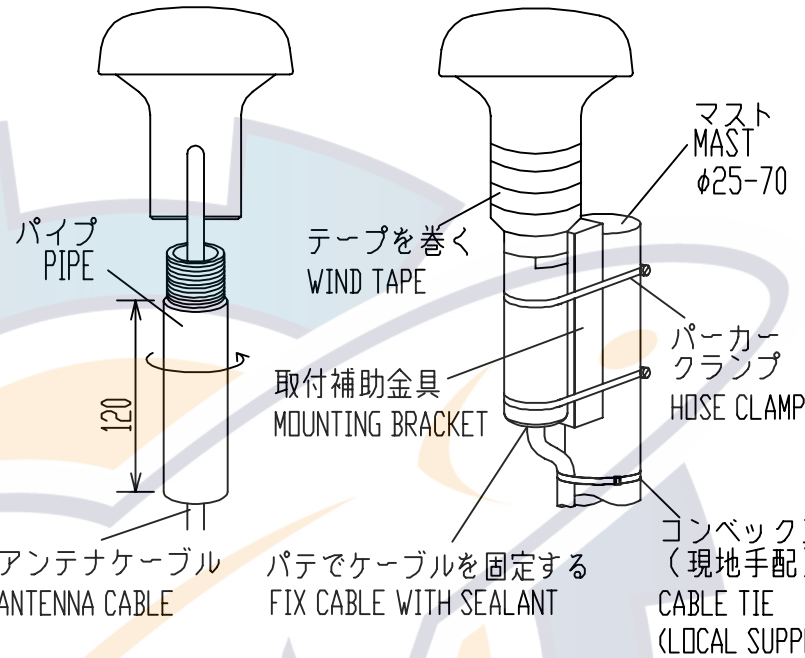
NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.

2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

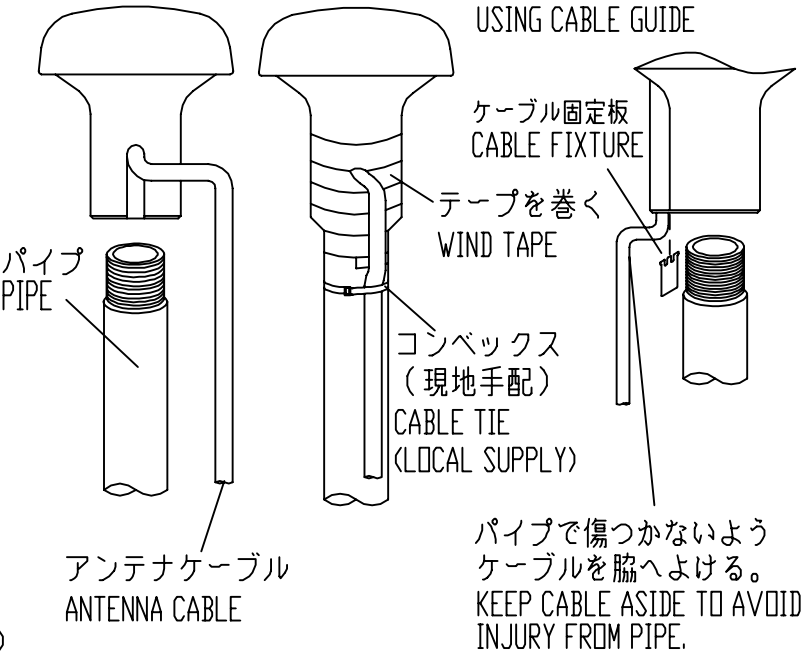
A) マストへの取付け

MAST MOUNTING

a) マスト取付金具CP20-01111(工事材料)でマストに固定する。
USE MAST MOUNTING KIT CP20-01111.



b) パイプのみを使うとき
USE A PIPE ONLY.



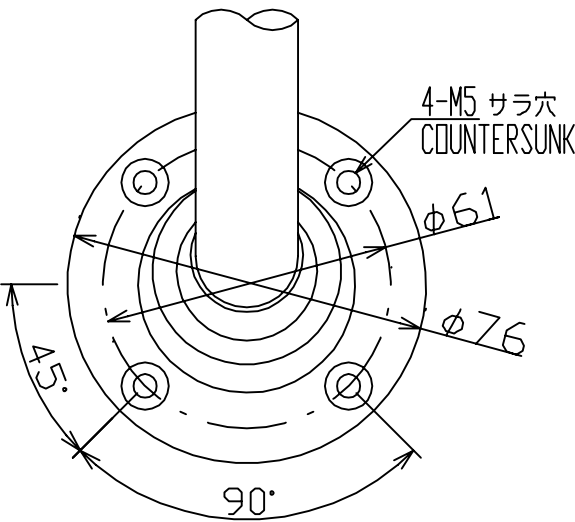
C) 取付ける場所が傾斜しているとき

ANTENNA BASE MOUNTING

オプションのアンテナベースを使う。
USE OPTIONAL ANTENNA BASE.

傾斜 INCLINATION	-5° - 33°	32° - 65°	65° - 98°
装備方法 MOUNTING METHOD			
アンテナ ベース型式 ANT. BASE TYPE コード番号 CODE No.	直型アンテナベース RIGHT ANGLE ANTENNA BASE No.13-QA330 000-803-239	L型アンテナベース L-TYPE ANTENNA BASE No.13-QA310 000-803-240	

アンテナベース基部
MOUNTING DIMENSIONS OF ANTENNA BASE.



DRAWN Dec. 14, '05 E.MIYOSHI		TITLE GPA series
CHECKED TAKAHASHI.T		名称 空中線部
APPROVED Y. Hatai		装備要領図
SCALE MASS		NAME ANTENNA UNIT
DWG.No. C4384-Y01- E		INSTALLATION PROCEDURE

